

Un-Stereotyping Autonomous Weapons?

Analysis for Lex International

Backgrounds, Arguments, Examples

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Introduction

Images shape our world and structure our thinking; we often believe what we see - and what we don't see might escape our thinking. This report examines the visual representation in the field of autonomous weapons: What do we see repeatedly? What is left unseen? And what are possible consequences?

Many are familiar with the problem: we search for images to accompany a text, for instance. In doing so, we often encounter the same recurring images on stock platforms or search engines—images that fail to capture the full complexity of the discourse. Their familiarity makes them seem suitable because they align with the images we already have in our minds.

With respect to autonomous weapon systems (AWS), we usually encounter a limited range of visuals, which support an apolitical understanding of both technological and societal aspects of such weapons and their meaning. What's often missing is the alternative image—and the idea behind it. This report seeks to address this issue by proposing a more diverse array of images, each with its own story to tell.

In order to reach our conclusions, we reviewed a broad range of visuals from the past 10 years from news media, stock photo platforms, and popular films as well as documentaries. The sources were restricted to English and German language outlets and we thus consider the patterns identified to be illustrative of Western discourses on autonomous weapon systems and artificial intelligence.

Images appearing frequently across different platforms were considered 'dominant'. We categorized them according to themes (AI-related images, sci-fi related images, military images) and analyzed the representations they featured as well as their omissions and contexts. To validate the outcomes, we related them to reports from advocacy groups and experts and embedded them in a literature review of academic debates on autonomous weapon systems and representations of artificial intelligence. This approach helped us identify which imagery shapes the current discourse around autonomous weapons and develop possibilities for alternative visuals that could provide a more balanced and accurate representation of the issue in media.

Current dynamics in the field of autonomous weapons

While many weapons can include autonomous elements by responding to external triggers with lethal force (e.g. landmines), autonomous weapon systems (AWS) are military systems that are programmed to identify and attack targets independently. They rely on artificial intelligence (AI) systems and use algorithms for detection and tracking of targets, predicting their movements and responding correspondingly (Longpre et al., 2022).

The global discourse surrounding artificial intelligence (AI) is increasingly shaping our world, with debates highlighting both its potential benefits and its risks. As geopolitical tensions rise, rapid technological advancements are making their way into the defense industry, particularly through the integration of autonomous technologies in weapon systems. These developments have sparked international discussions, but the pace of these advancements often outstrips the ability of regulatory frameworks to keep up. As a result, there are growing calls for an international treaty to limit the autonomy of weapon systems.

At the same time, algorithmic warfare (the integration of AI in military systems) has increasingly become part of geostrategic debates. States are “justifying their investments in the development of ‘AI’ technologies with arguments about the necessity of maintaining military superiority and deterring conventional conflicts” (Bode et al., 2023a) - a phenomenon often referred to as the so-called ‘AI arms race’. This phrase evokes the wide-spread belief in deterrence through militarization, i.e. the assumption that a strong military presence can discourage other actors from initiating conflict due to the risks being too high. While the notion of an ‘AI arms race’ has been criticized by scholars, not least because artificial intelligence is not a weapon in itself, even “perceptions of a ‘race’ to field AI systems before competitors do could cause nations to cut corners on testing, leading to the deployment of unsafe AI systems that are at risk of accidents that could cause unintended escalation or destruction” (Scharre, 2021, p. 122).

The effectiveness of international agreements is a significant concern in these discussions, especially when some of the world’s most powerful nations—such as the United States, Russia, and China—are reluctant to participate (Bode et al., 2023b). These countries increasingly use autonomous weapons in asymmetric warfare, where the balance of power is uneven (Monnett, 2024). The reluctance of political leaders to engage in

treaty-making processes raises doubts about the feasibility of regulating such weapons on an international scale (see also Lavazza & Farina, 2023).

Autonomous weapons systems raise profound and far-reaching ethical and legal questions. A critical issue is the extent of human involvement in the operation of these systems, when used in armed conflict. Moreover, it is often difficult to determine whether an autonomous weapon has been deployed, especially given the diverse range of military devices that can be equipped with or modified to include autonomous functionalities.

International humanitarian law, which is designed by humans for humans, confronts a fundamental question: Can a machine truly adhere to the rules of war? Since 2015, the International Committee of the Red Cross (ICRC) has “urged States to establish internationally agreed limits on autonomous weapon systems to ensure civilian protection, compliance with international humanitarian law, and ethical acceptability” (ICRC, 2021). Machines are designed to execute pre-programmed functions, but the ethical and legal judgments required in combat necessitate human oversight.

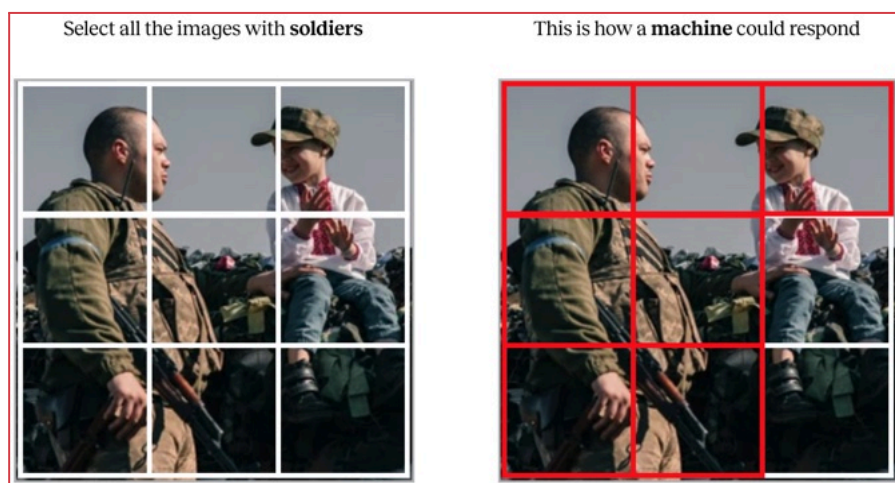
This raises concerns about whether autonomous weapons systems can comply with established principles of international law such as distinction, discrimination, proportionality, and the necessary precautions in warfare. Additionally, the question arises: Can and should machines (be programmed to) resist unlawful orders? (see Holland Michel, 2024) If they can, this could open a Pandora’s box of ethical dilemmas. If these systems can override human commands, critical questions about ownership and responsibility emerge: Whom does the weapon belong to, and who is ultimately accountable for its actions?

The concept of “dehumanization of warfare” is central to these concerns. In the context of autonomous weapons, this dehumanization can manifest in two ways: through inhumane actions carried out by machines (such as targeting civilians) and through actions that are no longer under human control.

Responsibility and accountability are crucial aspects of this debate. Traditional imputation rules, which determine who is accountable for actions in war, become complicated when autonomous weapons are involved. The UK’s policy, for example, emphasizes that legal responsibility for military actions remains with the last person to issue a command. This principle aligns with the just war tradition, which asserts that for any conduct to be regulated or judged, humans must be held accountable for violations such as war crimes. However, the challenge of assigning

responsibility becomes even more complex when considering the biases inherent in the data that underpin AI systems—biases that can perpetuate existing injustices against marginalized groups. These biases are evident in technologies like facial recognition, crime prediction, and the identification of soldiers, where AI can reproduce and even exacerbate societal inequalities.

Autonomous systems also present challenges to traditional concepts of decision-making and responsibility. Unlike humans, machines do not possess the capacity to adapt to changing circumstances; their code is fixed and unalterable once deployed. This limitation raises significant ethical concerns, particularly in scenarios such as caring for wounded soldiers, where human judgment and flexibility are crucial.



*Screenshot, Online Exhibition “Automated by Design”,
Identity 2.0/Stop Killer Robots¹.*

The development of these machines is inherently political, often serving the interests of domination, especially in the context of asymmetric warfare, where one side may have a significant technological advantage. This context raises further critical questions: How do general AI problems translate into the specific case of autonomous weapons? What is the value of human judgment in warfare, and how can these complex issues be effectively communicated to the public through visual representations?

The discussion of autonomous weapons systems is not just a technical or legal issue but a deeply ethical one that challenges our concepts of war, responsibility, and humanity. These systems force us to reconsider the value of human judgment in warfare and the ways in which we can ensure accountability in an increasingly automated world. As we grapple with

¹ <https://automatedbydesign.stopkillerrobots.org/targeted/>

these questions, it is essential to make these debates accessible to a broader audience, using clear explanations and compelling visual representations to convey the stakes involved.

Images of autonomous weapons in media and beyond

The difficulties of framing lethal autonomous weapon systems

Autonomous weapon systems (AWS) are weapon systems that can operate on their own and without human intervention with respect to identifying and attacking targets. Proponents of such weapons focus on the allegedly positive features of such weapons: they are deemed to be cheaper, more accurate (and thus potentially more compliant with international humanitarian law), more precise, and faster and thus seen to provide tactical advantages. Critics from science, civil society, and governments counter these arguments with references to legal, ethical and security-related points of references. Legally, they argue that only humans should be able to make decisions over life and death in war. They point to technological limitations with respect to proportionality and distinction between civilians and combatants. They warn of the possibility that autonomous weapons could trigger arms races and actually make conflicts more prevalent due to allowing for physical and psychological distances from battlefields and an alleged reduction of casualties (Rosert & Sauer, 2021, 15-16).

The difficulty of translating the debates from the fields of science & technology as well as policy for a broader public lies in both the complexity of the issue as well as in its ambivalences - of technological, political as well as ethical nature. Already the definition of “lethal autonomous weapons systems” is contested: first, “autonomy raises serious questions even if its effects are not lethal”, second, “the international community still struggles to define what autonomy is” and third, human (non-)involvement refers to a broad spectrum of possibilities (ibid.: 16), which is the reason why civil society is increasingly advocating for “meaningful human control”.

When it comes to translating the issue to a wider audience, journalists are thus faced with the challenge to create a clear and understandable framework - and visualize it with appropriate images. At the moment, these visualizations largely contain references to science fiction and abstract imaginations of artificial intelligence - even in academic contexts.



Selected examples of books covers, (most) published in academic presses since 2016, in chronological order².

In the past, other campaigns for banning certain types of weapons featured clear and simple messages. The issue of anti-personnel landmines (APLs), for example, could be framed through the (potential) harm to civilians, in both the presented messages as well as through images or artistic interventions. In contrast, autonomous weapons do not have clear characteristics or effects: “there are not only no iconic images

² Bhuta et al., 2016; Scharre, 2018; Gow et al., 2019; McFarland, 2020; Payne, 2021; Bode & Huelss, 2022; Mauri, 2022; Gonzáles, 2022; Seixas-Nunes, 2022; Gruszczak & Kaempf 2023; Watling, 2023; Garcia, 2024.

but also potentially myriad variants that, from the outside, might be indiscernible from remotely operated weapons” (Rosert & Sauer, 2021, p. 17). Furthermore, contrary to other weapons advocated against in the past, such LAWs do not/will not “produce characteristic injuries of the kind that were critical in justifying the reactive bans on APL (limb loss) and the preventive ban on BLW [blinding laser weapons] (blindness)” (ibid.). This lack of iconic imagery makes mobilizing the public to demand a ban more difficult. However, there is space for iconic images in the future - and the time to shape them is now.

The *Campaign to Stop Killer Robots* has constructed the term (and notion) of a ‘killer robot’ as a comprehensible, memorable and easily objectionable point of reference in its advocacy work. While simplifying the complexity of the issue for a lay public, the term itself might be problematic: it does evoke fear and prompts emotional reactions, by which it helps catch the attention of non-experts. However, it also keeps the issue entrenched in sci-fi fantasies and allows opponents of a ban to frame any efforts for regulation a “premature, speculative discussion about future weapons” (ibid.) - which is far from true. Autonomy in weapons is not limited to any one particular type of weapon — it can potentially be added to almost any system.



Event of the Campaign to Stop Killer Robots in Berlin, 2019³.

³ Campaign to Stop Killer Robots, Image by Ralph Schlesener, 2019.
<https://www.flickr.com/photos/stopkillerrobots/40467931743/in/album-72157705970474001>

The problem with selective imagery

Imagery currently used to visualize or illustrate stories about autonomous weapons heavily relies on several tropes: images derived from AI-related imaginaries, sci-fi inspired images, or images of weapons and/or soldiers. This limits the engagement of audiences by perpetuating a number of biases through stereotypical images. The images frame the issue as overtly technical/technological and unpolitical, sidelining the dimensions of the problem most directly related to audiences: the dimensions of society and governance.

For journalists seeking to report about autonomous weapons, the challenge is to neither overestimate nor under-estimate their audiences. This requires finding an appropriate level of complexity by selecting elements that adequately portray the aspects at hand. Currently, visuals circulating with respect to AI as well as autonomous weapon systems fail to do so. On the one hand, they suggest that audiences/viewers as lay people cannot possibly understand ‘what is going on’ by relying on futuristic or science-fiction-related imagery. Instead of helping viewers understand processes behind the development and potential deployment of technology, such images contribute to alienation and fatalism. When it comes to autonomous weapons systems, stereotypical AI-related imagery thus effectively hinders the democratization of the issue. On the other hand, viewers are perpetually underestimated by being confronted with only a limited range of images. Selecting aspects that non-experts actually *are* able to understand and supporting them in making relevant, informed decisions through democratic processes, requires appropriate imagery.

According to the initiative *Better Images of AI* (see Dihal & Duarte, 2023), dominant images have a number of effects: they conceal already existing societal and environmental impacts of AI, promote unrealistic expectations of the potentials and workings of AI, and “mask the accountability of the humans actually developing the technology” (Dihal & Duarte, 2023, p. 4). Furthermore, they perpetuate problematic stereotypes, for example with respect to gender and race. According to the authors, images of AI should draw on four principles:

- (1) honesty (“Does the image show what the AI system can actually do, and nothing more?”),
- (2) humanity (“Does the image show that AI is created by and for people?”),
- (3) necessity (“Do you need to show an image depicting AI?”, and
- (4) specificity (“What kind of technology are you showing exactly?”).

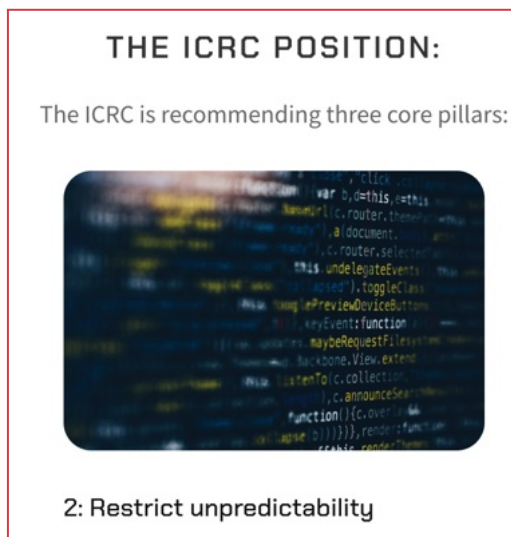
With respect to autonomous weapon systems, the answers to these questions relate to the complexities of the issue at hand. Being ‘honest’ with visuals might be difficult if the abilities of weapons are either still debated, not transparent, or when discussions relate to the ethics of their future deployment. People-related imagery pertains to those creating the weapons, but must also encompass those who are to become possible targets. Images of weapons don’t need to be always included but it is crucial to create a connection of the issue with the real-life experiences of audiences. Finally, specificity might not necessarily mean showing the exact kind of technology discussed but can also mean depicting the mechanisms at hand through parallels in history and other societal fields. To be increasingly ethical, selected visuals should thus contribute to the empowerment of audiences and their understanding of autonomous weapons being an issue that needs to be contested and negotiated within societies.

Contrary to that, the prevalent stock imagery to visualize stories about autonomous weapons is devoid of any references to ethics and contributes to an understanding of the issue as highly unpolitical. According to a blog post published on *Better Images of AI*, when it comes to autonomous weapon systems, “[b]etter images of AI would include humans who are behind AI systems and humans that might be potentially affected by them—both soldiers and civilians (e.g. some images and photos depict destroyed civilian buildings, see [here](#), [here](#), or [here](#)). Ultimately, imagery about AI in the military should ‘reflect the realistically messy, complex, repetitive and statistical nature of AI systems’ as well as the messy and complex reality of military conflict and the security sphere more broadly.” (Nadibaidze, 2024)

Dominant imagery used for visualizing AI can by itself be deemed to be “simply unethical” (Romele, 2022, p. 4), since it is “not humble, honest, sincere, or transparent” but rather “arrogant, and overconfident” (ibid.: 5). We are either confronted with futuristic depictions (e.g. artificial brains) or abstract images (e.g. descending code) that are by themselves inaccurate (especially when it comes to AWS) or with highly selective imagery (e.g. drones). Neither of these represent the complexity of the processes behind the development of autonomous weapons or the politics of autonomous warfare. We argue that the missing elements in the current visuals around lethal autonomous weapon systems are *people* and *politics*.



Screenshot, Carnegie Endowment for International Peace, 2017⁴.



Screenshot from Landing Page, Autonomous Weapons, A Project from the Future of Life Institute⁵.



Screenshot, Harvard Medical School, 2024⁶.



Screenshot, Federal Foreign Office of Germany, 2020⁷.

Images of descending code reflect the cultural impact of the Matrix movie series (1999-2023) and are used even by high-level actors (see above) (see also Gibson 2024).

⁴ Wolfsthal, J. (2017, August 31): Killer Robots are Coming, and the U.S. Isn't the Only Buyer. Carnegie Endowment for International Peace.

<https://carnegieendowment.org/posts/2017/08/killer-robots-are-coming-and-the-us-isnt-the-only-buyer?lang=en>

⁵ <https://autonomousweapons.org/>

⁶ Caruso, C. (2024, August 7): The Risks of Artificial Intelligence in Weapons Design. Researchers outline dangers of developing AI-powered autonomous weapons. Harvard Medical School, News & Research.

<https://hms.harvard.edu/news/risks-artificial-intelligence-weapons-design>

⁷ Federal Foreign Office of Germany (2020, April 2): Forum on Lethal Autonomous Weapons Systems.

<https://www.auswaertiges-amt.de/en/aussenpolitik/themen/forum-laws/2330682>

According to the theory of collective symbolic coping, people make sense of new technologies in different stages, which are reflected also in the images used in media to visualize these technologies. First, the public becomes aware of a new technology through increased media attention. Second, “we observe the use of an increasing number of often fantastic images that are supposed to capture the gist of the novel in iconic form”. Third, the visuals circulating will gradually “converge to a few that are considered particularly fitting”. Such images function as “memes by spreading the gist of a representation and a simplified understanding of the technology” (Wagner et al., 2023). These images, or patterns of representations, allow audiences to take part in the debate around the issue. They serve as attention hooks and provide recognizability. While the “representation does not need to be a veridical reproduction of the issue” (ibid.), it does shape the discourse around an issue.

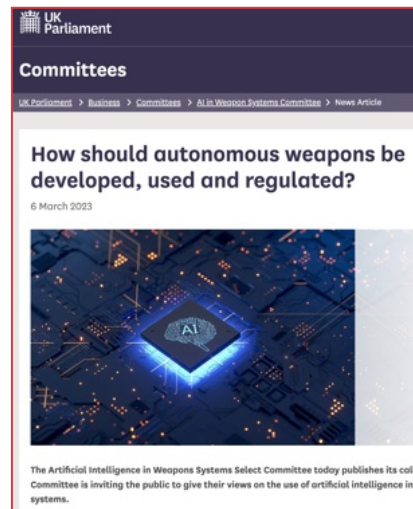
“Representative polling data shows that growing majorities in many countries oppose LAWS [lethal autonomous weapon systems], mainly due to concerns about crossing a moral line” (Rosert & Sauer, 2021, p. 20). It can thus be assumed that large parts of the global public have become aware of the relevance of the issue. Western media discourse is still permeated by “often fantastic images”, often derived from the representation of AI in a wider sense. We argue that now is the critical time to intervene in visual communication by providing more appropriate images that will ultimately ‘stick’ in the public perception in a critical way and contribute to demanding governance with respect to lethal autonomous weapon systems.

Patterns of representation

The problem of autonomous weapons refers to a highly contested field, marked by high complexity with respect to all its dimensions - among them not only science and technology but also politics and policy-making, international law, economics, society, and culture. At the same time, the visual representations accompanying the debates are stunningly homogenous and clichéd. Whether we look at news reports, TV segments, advocacy campaigns, or academic publications: they mostly feature a narrow range of stereotypical images.



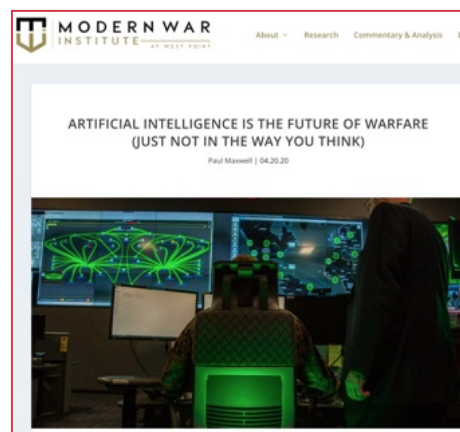
Screenshot, Popular Mechanics, 2023⁸.



Screenshot, AI in Weapon Systems Committee/UK Parliament, 2023⁹.



Screenshot, C4ISRNET 2017¹⁰.



Screenshot, Modern War Institute at West Point (US Military Academy), 2020¹¹.

Illustrative examples of articles on autonomous weapon systems and algorithmic warfare from diverse actors, which include stereotypical visuals of low informational value.

⁸ Newcomb, T. (2023, January 31): Pentagon Urges 'Appropriate Levels of Human Judgment' When Dealing With Killer Robots. Popular Mechanics.
<https://www.popularmechanics.com/military/weapons/a42723887/pentagon-rules-for-killer-robots/>

⁹ AI in Weapon Systems Committee (2023, March 6): How should autonomous weapons be developed, used and regulated? UK Parliament.
<https://committees.parliament.uk/committee/646/ai-in-weapon-systems-committee/news/186511/how-should-autonomous-weapons-be-developed-used-and-regulated/>

¹⁰ Williams, B. (2017, August 28): Experts call for public debate on 'lethal autonomous weapons systems'. C4ISRNET.
<https://www.c4isrnet.com/dod/2017/08/28/experts-call-for-public-debate-on-lethal-autonomous-weapons-systems/>

¹¹ Maxwell, P. (2020, April 20): Artificial Intelligence is the Future of Warfare (Just Not in the Way You Think). Modern War Institute at West Point.
<https://mwi.westpoint.edu/artificial-intelligence-future-warfare-just-not-way-think/>

What we see: brains, drones, robots

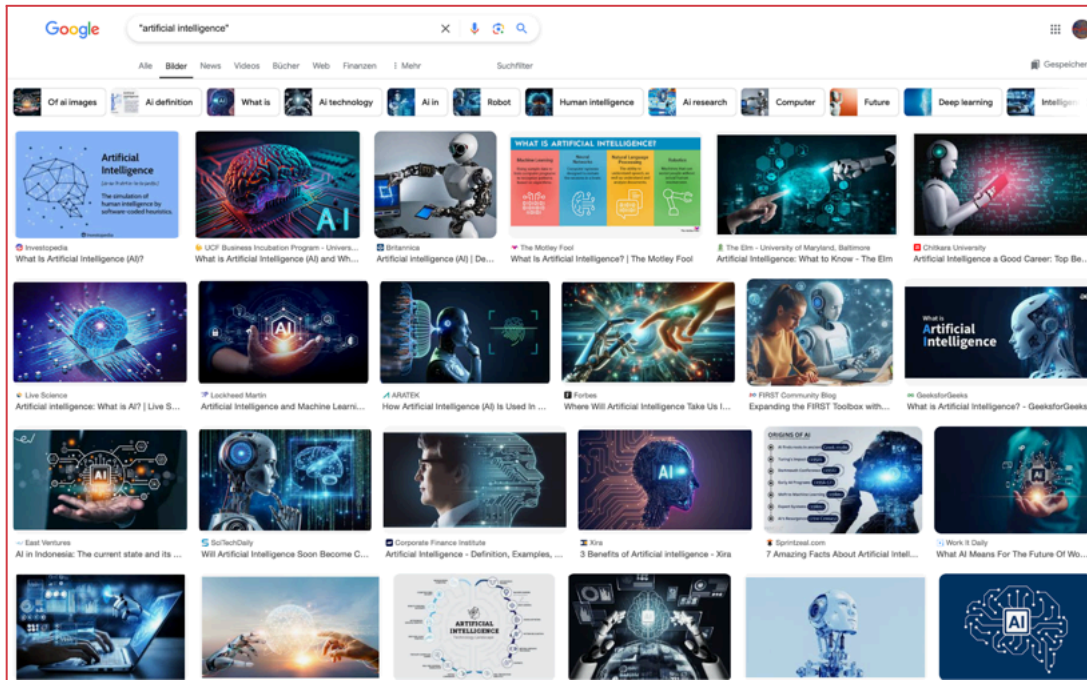
Current visual communication on autonomous weapons combines elements of such stereotypical imagery from two contexts: we are either confronted with images related to artificial intelligence in a broad sense, which stand for the dimension of ‘autonomy’, or with images that foreground the military dimension by depicting soldiers, battlefields, or specific weapons. We either see blue, stylized human brains - or drones. The depiction of drones or drone swarms combines both elements, since they (often falsely) stand for flying and attacking targets ‘on their own’. More explicit depictions also feature literally killing robots (humanoid robots with guns), armed robodogs, or other science-fiction inspired visuals that combine militaristic and futuristic features. Sci-fi related representations predominate; “indeed, almost every nontechnical article on the subject contains a reference to science fiction, a stock photo of a menacing robot assassin, or both.” (Leys, 2018, p. 50)

(a) Imagery related to ‘Artificial intelligence’

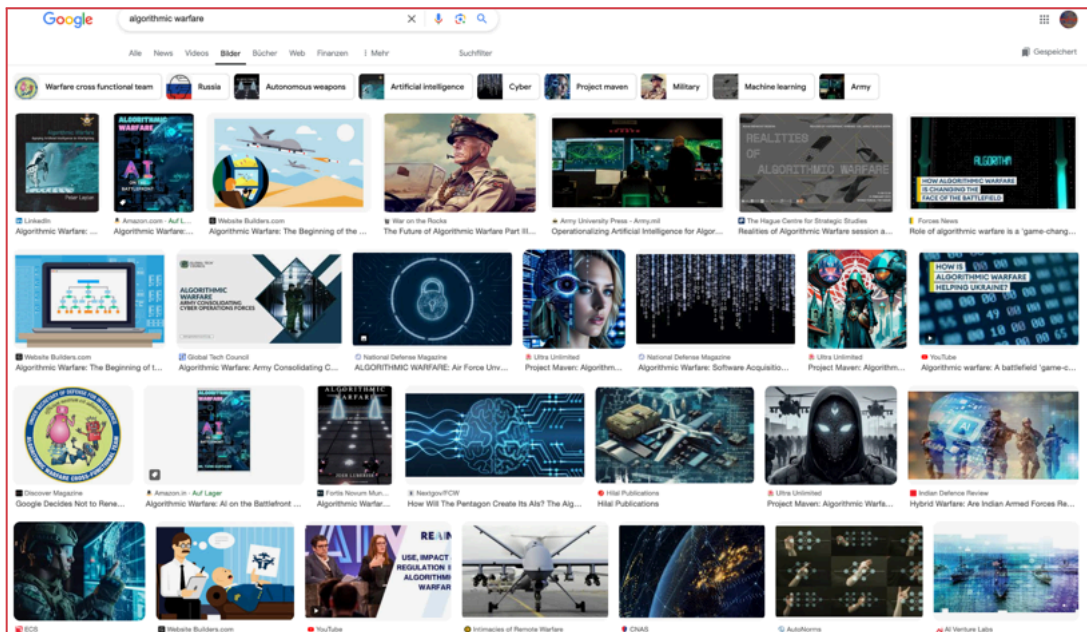
Images referring to the ‘algorithmic dimension’ of autonomous weapons are derived from popular representations of artificial intelligence¹², such as programming code floating around a screen, images of the human brain, anthropomorphic images (that depict artificial intelligence as a human or humanoid), etc. If people are featured, it is usually white men in suits, suggesting control, rationality, and power (over the machine or the programming process).

Such representational patterns have problematic implications: they are not only devoid of the diversity of societies, but also suggest distance and neutrality, and ascribe machines with human characteristics. In sum, such images mask “the agency and accountability of those who have made the AI system” (Dihal & Duarte, 2023, p. 11) but also neglect all those (potentially) impacted by it. They present a select and biased understanding of artificial intelligence and serve to construct misleading notions of the functionality and impact of autonomous weapons.

¹² For a critical and insightful overview, see the full report of Better Images of AI (Dihal & Duarte, 2023).



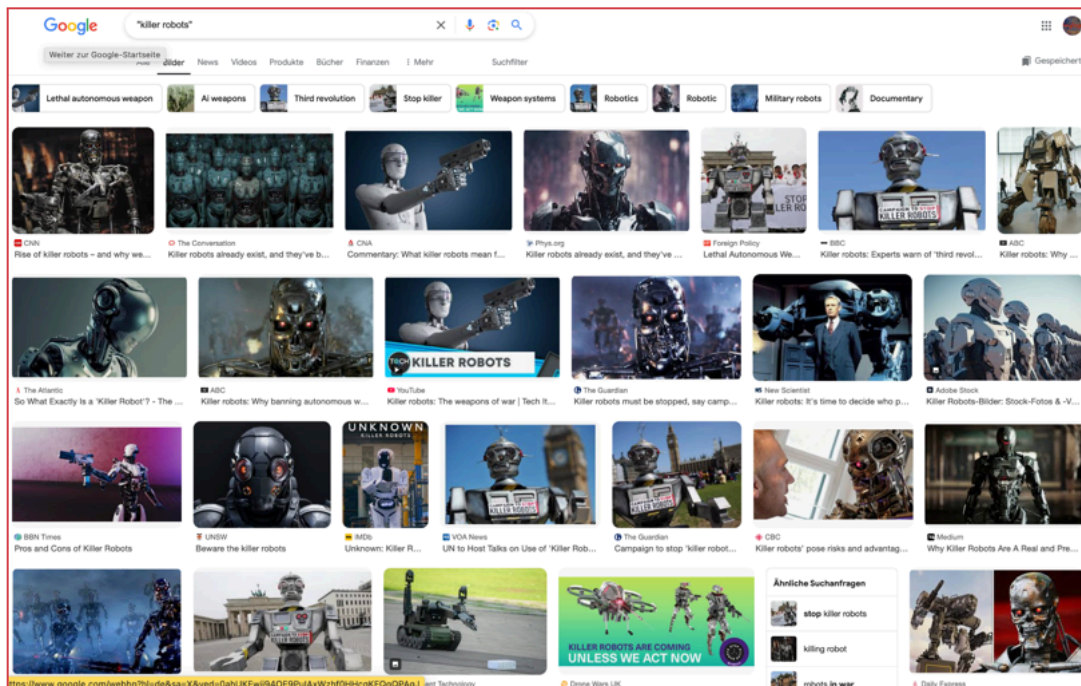
Screenshot, Google Image Search for "artificial intelligence" in October 2024.



Screenshot, Google Image Search for "algorithmic warfare" in October 2024.

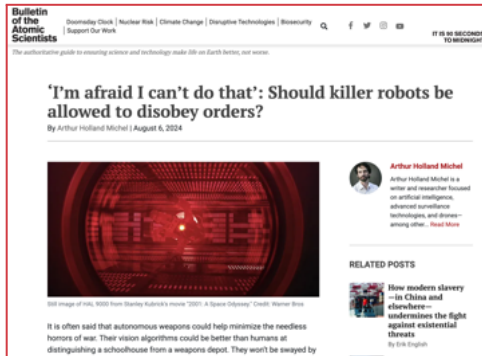
(b) Sci-fi imagery

While science-fiction inspired images might seem to be rather ‘innocent’ references to popular culture, they heavily influence the way not only lay-people but also policy-makers think about and conceptualize autonomous weapons: “popular culture not only diffusely influences the real world by shaping what counts as appropriate behavior, but also more directly shapes the calculations of political actors and the content of political speeches” (Stimmer, 2019, p. 432, quoted in Bode et al., 2023a). References to sci-fi do have a real impact on public opinion - which is one of the reasons that the Campaign to Stop Killer Robots, for example, put a deliberate effort to “de-science-fictionalize” the issue (Carpenter, 2016).



Screenshot, Google Image search for “killer robots” in October 2024.

Another aspect worth noticing is that “while science fiction references may harden anti-killer robot attitudes among that portion of the population who consume a lot of science fiction, the general public's strong opposition to autonomous weapons must be related to other factors than ‘negative media portrayals’ in movies and TV or the use by campaigners of the term killer robots” (Young & Carpenter, 2018). This means that such images do not convince people, but still have an impact on the overall discourse - or rather, its limitations.

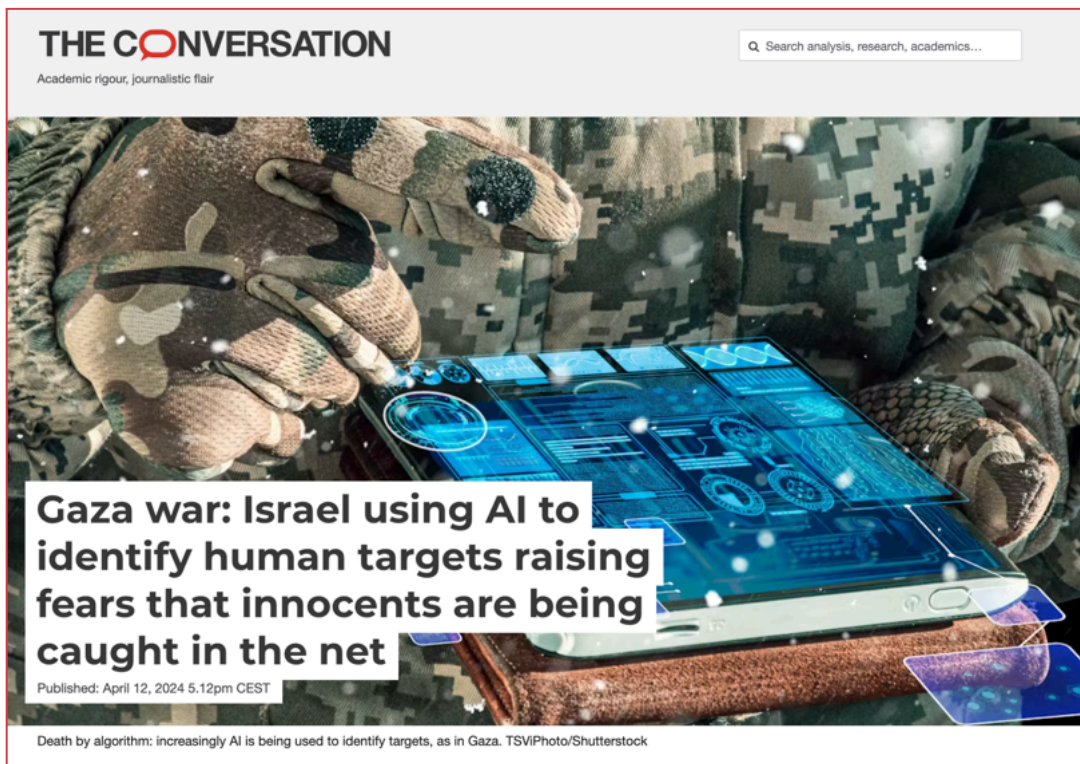


Screenshot, *Bulletin of the Atomic Scientists*, 2024 (Holland Michel, 2024).



Screenshot, *The Guardian*, 2015¹³.

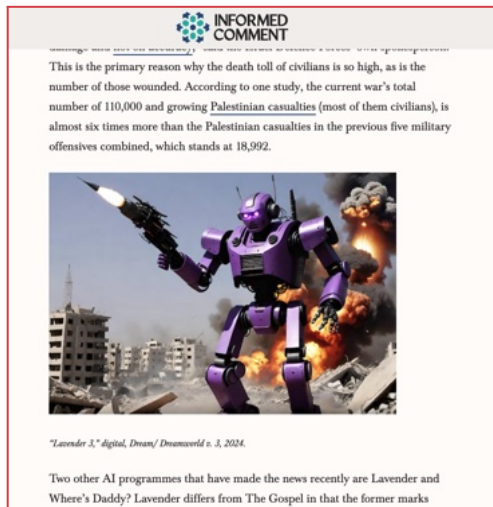
It is concerning that sci-fi inspired images (usually created with generative AI) are at times also used for visualizing real-life examples and current developments in ongoing conflicts:



Screenshot, *The Conversation*, 2024¹⁴.

¹³ Gibbs, S. (2015, July 27). Musk, Wozniak and Hawking urge ban on warfare AI and autonomous weapons. *The Guardian*. <https://www.theguardian.com/technology/2015/jul/27/musk-wozniak-hawking-ban-ai-autonomous-weapons>.

¹⁴ Schwarz, E. (2024, April 12). Gaza war: Israel using AI to identify human targets raising fears that innocents are being caught in the net. *The Conversation*. <https://theconversation.com/gaza-war-israel-using-ai-to-identify-human-targets-raising-fears-that-innocents-are-being-caught-in-the-net-227422>



Screenshot, *Informed Comment*, 2024¹⁵.



Screenshot, *The Siasat Daily*, 2024¹⁶.

The two screenshots above include AI-generated visuals linking the theme of lavender (color and plant) with algorithmic warfare (a killer robot and a humanoid robot), used to illustrate the issue of AI-assisted targeting by Israel in Gaza. These are exceptions, included here as overly problematic examples. In contrast, stories across diverse media outlets covering the deployment of the 'Lavender' program mostly feature birds-eye view images of destruction from the Gaza strip as well as images of wounded civilians¹⁷:



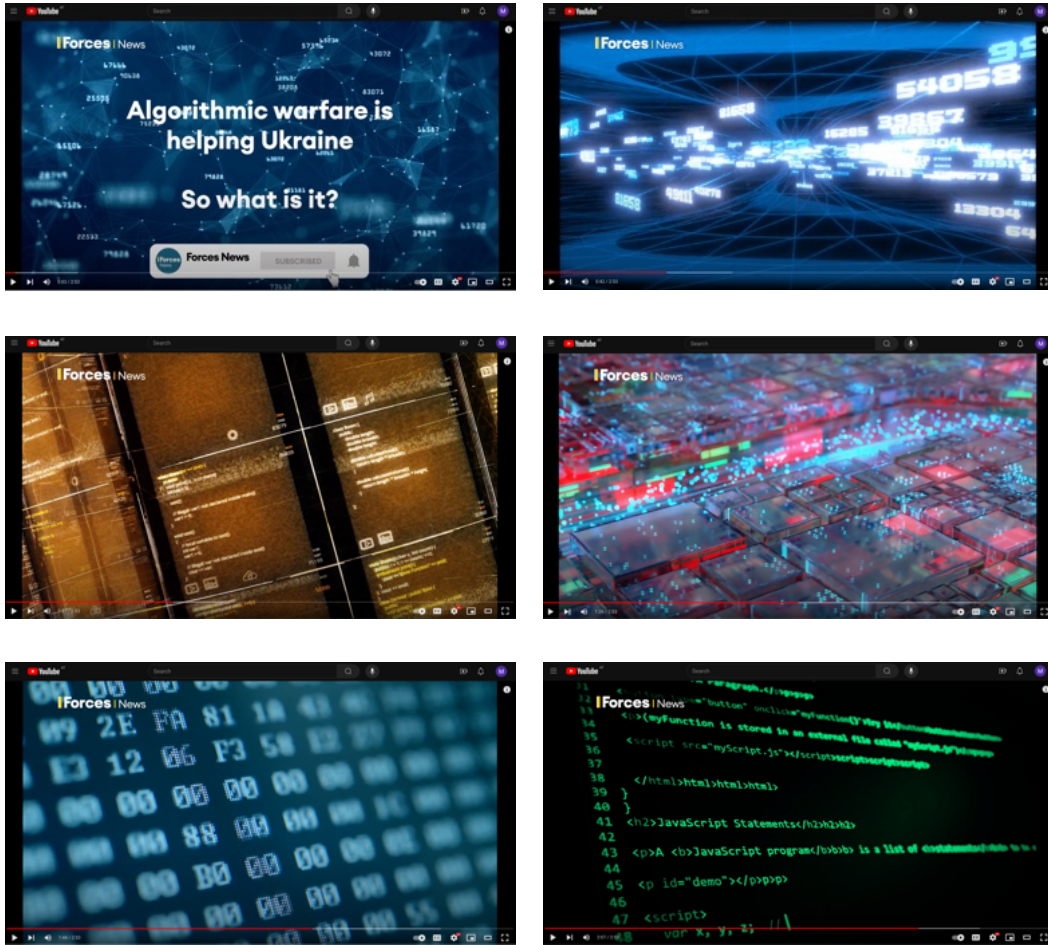
Screenshot, *The Guardian*, 2024¹⁸.

¹⁵ Ishfaq, S. (2025, June 4). Israel's AI-Powered Genocide. *Informed Comment/Middle East Monitor*.
<https://www.juancole.com/2024/06/israels-powered-genocide.html>

¹⁶ Fatima, S. (2024, April 5). Israel uses AI 'Lavender' to identify bombing targets in Gaza. *The Siasat Daily*.
<https://www.siasat.com/israel-uses-ai-lavender-to-identify-bombing-targets-in-gaza-3004314/>

¹⁷ See also Abraham, Y. (2024, April 3). 'Lavender': The AI machine directing Israel's bombing spree in Gaza. *+972 Magazine*. <https://www.972mag.com/lavender-ai-israeli-army-gaza/>

¹⁸ McKernan, B. & Davies, H. (2024, April 3): 'The machine did it coldly': Israel used AI to identify 37,000 Hamas targets. *The Guardian*.
<https://www.theguardian.com/world/2024/apr/03/israel-gaza-ai-database-hamas-airstrikes>



Stills from a video clip of the British Forces Broadcasting Service (BFBS) discussing the use of algorithmic warfare in relation to Ukraine.¹⁹



Screenshot, National Defense (Magazine of the National Defense Industrial Association, USA), 2023²⁰.

¹⁹ BFBS Forces News (2023, January 16). Algorithmic warfare: A battlefield 'game-changer' [Video]. <https://youtu.be/jUTs767BuF8?si=1iCiHUmMqJ4yxMaA>

²⁰ Fontes, R. & Kamminga, J. (2023, March 24): Ukraine A Living Lab for AI Warfare. National Defense. <https://www.nationaldefensemagazine.org/articles/2023/3/24/ukraine-a-living-lab-for-ai-warfare>

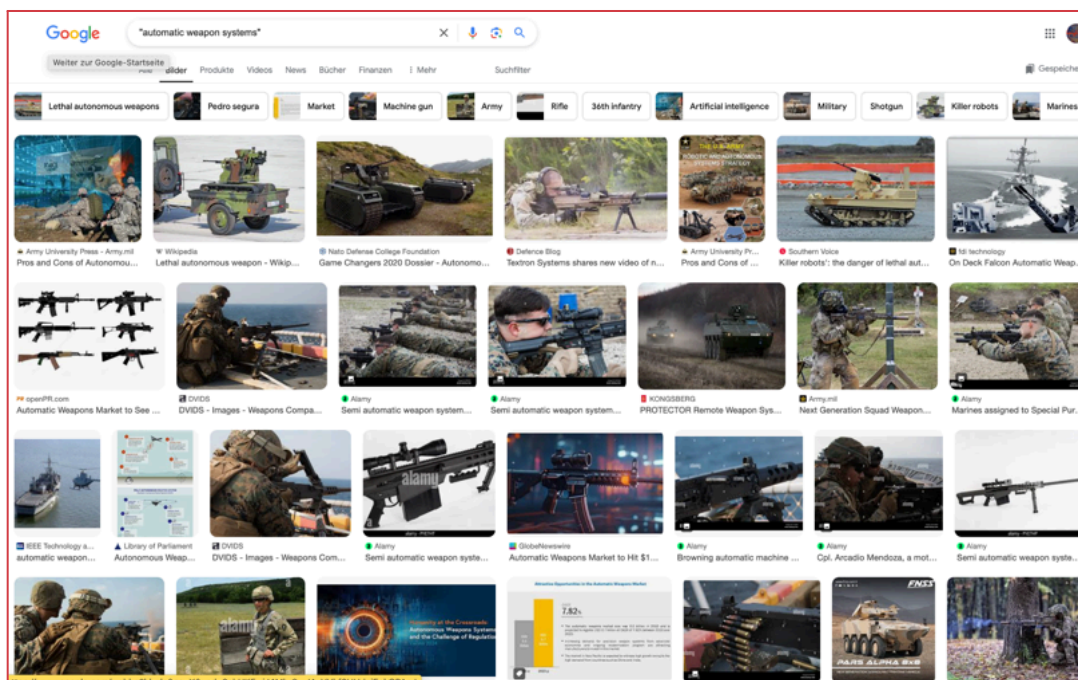
(c) Military imagery

Three patterns emerge with respect to images related to the explicit military aspect of the issue:

- 1) images of specific weapons (most often drones or drone swarms),
- 2) images of soldiers operating machinery, and
- 3) drone images (visuals recorded by drones themselves).

Depictions of weapons are used to illustrate weapons as such or to picture differing levels of autonomy. While these often are not lethal autonomous weapon systems as such, they do serve an illustrative purpose. Images of soldiers refer to notions of human involvement, while drone images are the only visuals that focus on potential targets.

All of these images present a biased and selective understanding of autonomous weapon systems. They often celebrate (patriotic) militarism and present weapons and those potentially operating them in an isolated, at times celebratory manner. Most importantly, they separate the issue from its impact on ‘real lives of people’ and construct a distance between the viewers and the issue at hand.



Screenshot, Google Image search for “automatic weapon systems” in October 2024.

What we don't see: people and politics, stories and solutions

What we don't see are humans. There is a lack of human presence in visualizations related to autonomous weapon systems. If there are humans depicted, it is either those programming or utilizing the weapons (coders and soldiers) and, rarely, men in suits (diplomats in negotiations). We never see any 'regular' people - neither from the societies that are prominent in the weapons development, nor from those societies that will potentially become their targets (or that are already targeted with weapons featuring autonomous elements).

We don't see any references to social injustices or societal impacts. We don't see the environmental cost of autonomous systems, from their production (including the mining of resources) to their deployment. We don't see any images pointing to power imbalances or the political dimension of the issue - the exclusion of the public from decision-making, those actually making the decisions or having an impact on how they are made. We don't see people - citizens, activists - engaged in shaping AI policy through protests and demands for regulatory policies or bans. Finally, we don't see AI as tools. We see AI as beings and weapons as almost-beings - both seem equipped with sentient or magical forces, instead of being something out of this world that can be named, analyzed, and understood.

The stereotypical images discussed above leave no room for connection. Viewers are not invited to establish any relation to the issue of autonomous weapons, even though their lives are inextricably linked with the issue: their data might be used to program the respective algorithms, their governments might devote large budgets to their development, they might become targets themselves. They don't see any possibilities for acting as citizens or humans. There is a dire need for stories that present (and visualize) select elements of the complex problem and relate it to the lay public, including easily understandable explanations.

The patterns of representation and the bias inherent in visuals are thus marked by a number of absences: the lack of visuals illustrating real-life effects, the absence of solutions, the omission of human beings. Focusing less on abstract notions of 'technology' and more on 'people' is an approach for all three of these problems: people are affected, people are working on solutions, people are implicated in all processes within the field - from resource extraction or the manufacturing of chips to negotiations in the United Nations or civil society activism. Countering the 'dehumanization bias' is one step towards more useful visuals. This includes diversifying not only the visuals (by including people other than

‘white men in suits/uniforms) but also the stories: how are diverse people across the globe, including those from marginalized societal positions, impacted by the development and employment of autonomous weapons?

Another step is countering the ‘Western bias’ - there is little coverage of the relevance of AWS for countries outside of powerful countries, especially in the Global North. The issue is usually geared towards the perspectives of countries in the Global North, which might use such weapons to protect and/or enhance their power. Including perspectives from the Global South (including those states that could potentially bear the brunt of these weapons) would open up the discourse to include important yet underrepresented perspectives and understandings.

The screenshot shows a webpage from Africa Renewal. At the top, there is a navigation bar with 'Africa Renewal' logo, 'E-MAGAZINE', 'STORIES', 'TOPICS -', and 'PODCAST'. Below the navigation bar, there is a 'GET MONTHLY E-NEWSLETTER' form with fields for 'email address *' and 'first name *', and a 'Subscribe' button. The main content area features a 'PEACE AND SECURITY' tag and the article title 'Unregulated Autonomous Weapons Systems pose risk to Africa'. Below the title, a sub-headline reads: 'Ambassador Lansana Gberie of Sierra Leone warns of a new arms race that could divert important resources away from peacebuilding and sustainable development'. The author information includes a small profile picture, 'From Africa Renewal: May 2024 | 17 May 2024', and 'By: Kingsley Ighobor'. Below the text is a large photograph of a conference. In the foreground, a man in a white traditional robe is speaking at a podium. The audience, consisting of many people in formal attire, is seated at round tables with green tablecloths. The room has a checkered floor and blue and green draped curtains.

Screenshot, Africa Renewal/United Nations, 2024²¹. Article about 2024 conference of Economic Community of West African States (ECOWAS) states in Sierra Leone about Autonomous Weapon Systems. Image shows the President of Sierra Leone, Julius Maada Bio, delivering a keynote address to the audience.

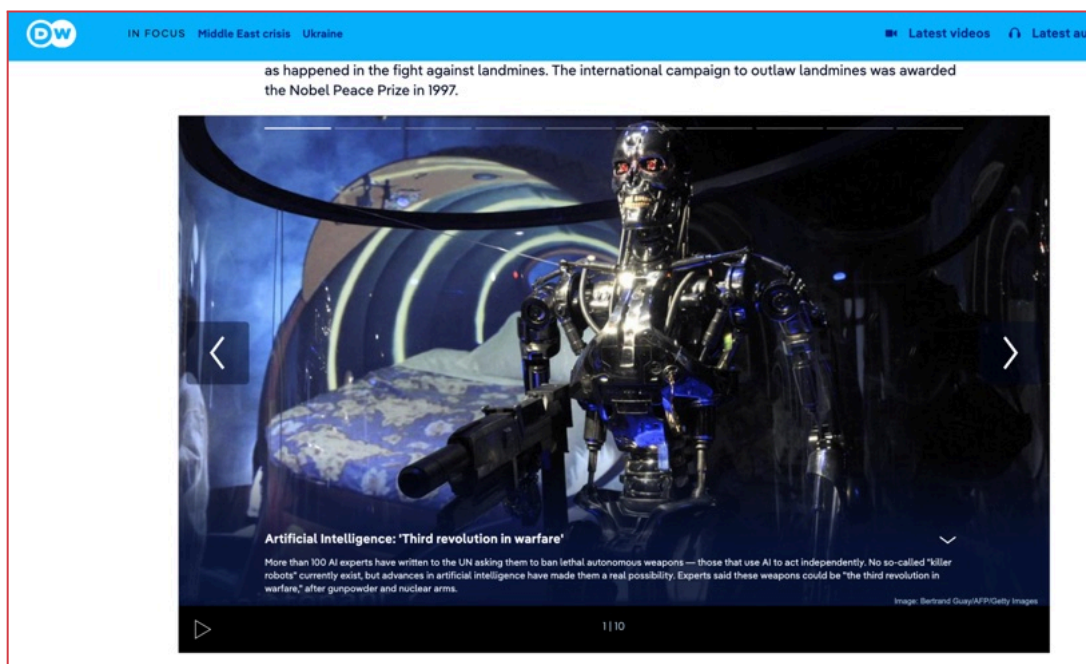
²¹ Ighobor, K. (2024, May 17). Unregulated Autonomous Weapons Systems pose risk to Africa. Africa Renewal. <https://www.un.org/africarenewal/magazine/may-2024/unregulated-autonomous-weapons-systems-pose-risk-africa>.

Busting Autonomous Weapons Myths

A number of myths regarding the development and deployment of autonomous weapon systems are inscribed in the dominant images used and, at the same time, perpetuated by these very images. On the following pages, we discuss these myths and suggest alternative images to extend the understanding transmitted visually in order to change biased narratives on autonomous weapons and algorithmic warfare.

“AI technology is uncontrollable, autonomous weapons can be(come) uncontrollable.”

Images that perpetuate the myth: sci-fi imagery, the Terminator, etc.



Screenshot, Deutsche Welle, 2018²². Alt text: “Terminator robot from the famous film.”

²² Werkhäuser, N. (2018, August 27): Should 'killer robots' be banned?. Deutsche Welle. <https://www.dw.com/en/should-killer-robots-be-banned/a-45237864>

CONFLICTS

Should 'killer robots' be banned?

Nina Werkhäuser
08/27/2018

In wars of the future, life-or-death decisions may be made by machines — independent of human control. The development of autonomous weapons is moving fast. The UN in Geneva is trying to get countries to agree on a ban.



Image: picture-alliance/NurPhoto/Seung-il Ryu

Screenshot, *Deutsche Welle*, 2018²³. Caption: Robot Method II standing in hall in South Korea.

Alternative images: visuals including concrete actors in charge and potential groups/regions being targeted. Real-world contexts.

Futuristic and sci-fi-inspired imagery supports the myth that humanity has lost (or might in a not so distant future lose) control over AI. In reality, however, control is not ‘lost’ but unequally distributed: a small number of powerful actors are controlling the development and spread of AI. Equally, the control over the creation of autonomous weapon systems and the decisions with respect to the abilities they are supposed to be equipped with are in the hands of a small minority of stakeholders.

The so-called “alignment problem” refers to the “development of technical mechanisms for ensuring AI systems learn and perform in accordance with intended expectations, intentions and values” (Cugurullo, 2024). Alignment is often presented as a result of the technological possibilities of AI (and thus, autonomous weapons), while it is, in essence, a societal and social problem.

²³ Werkhäuser, N. (2018, August 27): Should 'killer robots' be banned?. *Deutsche Welle*.

<https://www.dw.com/en/should-killer-robots-be-banned/a-45237864>

Reframing the alignment problem requires focusing on

- 1) people already affected by AI systems,
- 2) “stakeholders who actively govern their technological development” and
- 3) “how the production of AI is controlled by countries and multinationals seeking to seize economic benefits” (ibid.).

Overly focusing on the potential of superintelligent AI to create unimaginable harm distracts from the very imaginable harm that is already being done by contemporary AIs. The more concretely non-experts can understand that control of AI (and, thus, of autonomous weapons) is more profoundly a societal issue, rather than (merely) a technological or philosophical challenge, the more they will be willing to engage in decision-making, democratic contestation and governance.

Furthermore, biased and fearful perceptions of new technologies are not new. In the Industrial Revolution, societies were confronted with expected outcomes for those who perpetuated them - productivity increases due to new machinery. But most people were faced with environmental deterioration, rapid urbanizations, the spread of diseases and high death rates. In that context, it was - just as today - few people who were in control, with “a type of power (the power to shape technological innovation) that is unevenly distributed across society” (ibid.). Also today, it is not ‘humanity’ that has lost control over technological innovation - rather, “there are always specific actors making choices that determine the nature, scope and place of technology.” (ibid.)

Similarly, ‘humanity’ as such is not endangered by autonomous weapon systems. Rather, certain people are in danger, because others - concrete actors - might deploy them for their own benefit.

“Technological innovation is the natural result of progress.”

Images that perpetuate the myth: unrealistic & futuristic images, images of humanoid robots, graphs that suggest linear progressions, etc.



Screenshot, OpinioJuris, 2023²⁴

Alternative images: historical case studies; images showing humans involved in decision-making or activism and in technological development (policy-makers, scientists, activists, etc.).

Since the ‘computer revolution’, technological progress has often been presented as inevitable, constructed as an almost natural progression of increasingly refined technology, producing ever better technology in exponential ways. However, technological innovation is shaped by societal, political, and economic forces - it is the result of concrete decisions made by concrete actors. Individuals and organizations, governments and corporations - it is specific stakeholders who make decisions which technologies are to be developed, funded, and used - and at which cost. Technological progress is neither natural nor neutral but the result of specific choices and priorities.

²⁴ Hoffberger-Pippan, E. & Voahs, V. (2023, April 25): Taming the Lions: The Role of Industry in the Debate on Autonomous Weapon Systems (AWS). Opinio Juris. <https://opiniojuris.org/2023/04/25/taming-the-lions-the-role-of-industry-in-the-debate-on-autonomous-weapon-systems-aws/>

With respect to autonomous weapon systems, these choices are impacted by the economic and power-related interests of specific governments, militaries, and industries that benefit from their development and deployment. They do not have to be accepted. Societies can choose to set different priorities. In order to empower citizens and civil society to influence these decisions, agency has to be made accessible - and visible through appropriate images.

Moreover, transnational technological companies have become key actors in geopolitics, having access to resources and power that surpasses many nation states; “altering who succeeds and who fails in conflict” and being able to “make decisions that are impactful and beyond state control”, also in wars (Cronin, 2023).

References to artificial intelligence “can be particularly problematic because it may evoke thinking about systems that have a comprehensive, human level of intelligence” (Bode et al., 2023), which is not the case. Moreover, “algorithmic warfare does not mark a completely new departure in the history of war but rather the continuation of a longer trajectory of machine-assisted decision making.” (ibid.)

There are many historical parallels that can be offered to audiences as anchors for attention - especially when historical and political differences are explained. Examples include colonialism and imperialism: The Dutch East India Company or the English East India Company acted as military entities that supported colonization through military and even legal means. While they were active in a very different historical context, “when state sovereignty was more loosely defined” (Cronin, 2023, p. 6), parallels can be drawn - at least for illustrating the role of private actors. While it might seem counter-intuitive to use historical illustrations for visualizing the most advanced technological developments, such images might be a useful way to grab the attention of audiences. Moreover: “Today’s major tech companies are operating as pseudo-governments by dominating digital space, controlling access to information, building vast data empires, and controlling online commerce—all of which affect war and peace.” (ibid.)

Other historical examples that illustrate how technological advances are not a ‘natural’ development but rather the result of power relations and the desire to extend or hold on to power - which can be mentioned and accompanied by visuals:

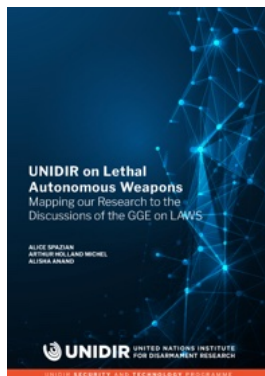
- the Industrial Revolution in Britain: invention of the steam engine or mechanized textile production were driven by concrete actors aiming to maximize profits and control labor

- the development of railways in different contexts (e.g. by colonial powers on the African continent, serving their needs for resource extraction)
- the mechanization of Soviet agriculture led by Stalin in early 1930s
- the Manhattan Project (which led to the creation of nuclear weapons)
- the so-called Space Race (Cold War)
- the Meiji Restoration in late 19th century Japan that brought about rapid industrialization and modernization.

“The problem is that, in the present, we do not see these individuals. We do not see them acting and making choices that shape technological development. What we do see are the technologies that are being produced and the changes they cause, altering society and the environment at a fast pace.” (Cugurullo, 2024)

“Autonomous weapons are too complex for you to understand.”

Images that perpetuate the myth: abstract visual representations of data flows, futuristic machine parts, etc.



Cover of the UNIDIR report on lethal autonomous weapons, 2021²⁵.



Vienna Conference on Autonomous Weapons Systems Banner, 2024²⁶.

Alternative images: visuals illustrating the increasing role that AI plays in societies, real-world contexts of diverse people (of different genders,

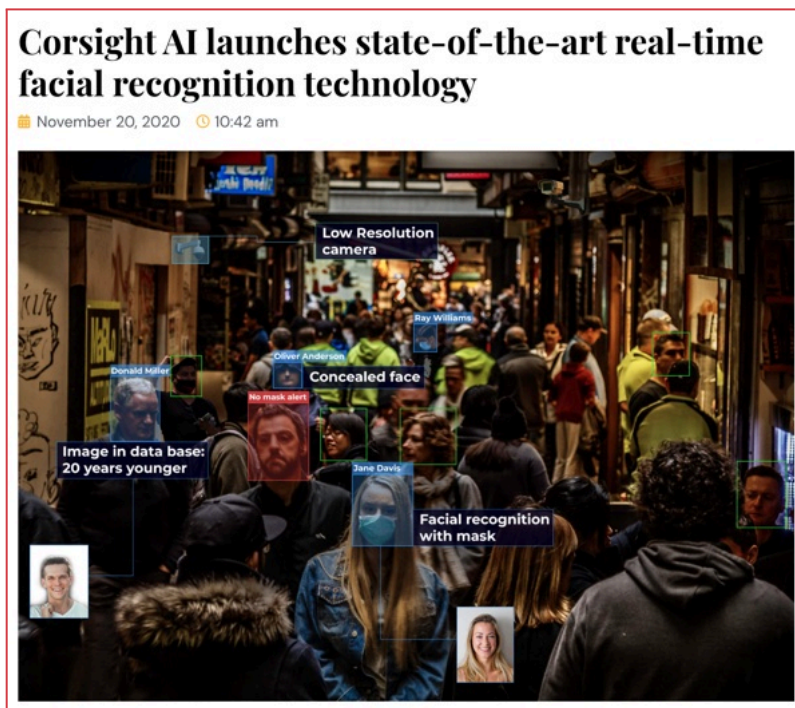
²⁵ Spazian, A./Holland Michel, A./Anand, A. (2021): UNIDIR on Lethal Autonomous Weapons. Mapping our Research to the Discussion of the GGE on LAWS. UNIDIR. <https://unidir.org/wp-content/uploads/2023/05/UNIDIR-on-Lethal-Autonomous-Weapons-Final.pdf>

²⁶ Federal Ministry for European and International Affairs, Austria, 2024. <https://www.bmeia.gv.at/en/european-foreign-policy/disarmament/conventional-arms/autonomous-weapons-systems/2024-vienna-conference-on-autonomous-weapons-systems>

races, religions, ages, abilities, etc.) interacting with AI technology; spaces of decision-making (UN bodies, governments) and public contestation, etc. Illustrating simple mechanisms and selected elements of processes. Visualizing effects instead of technological details.

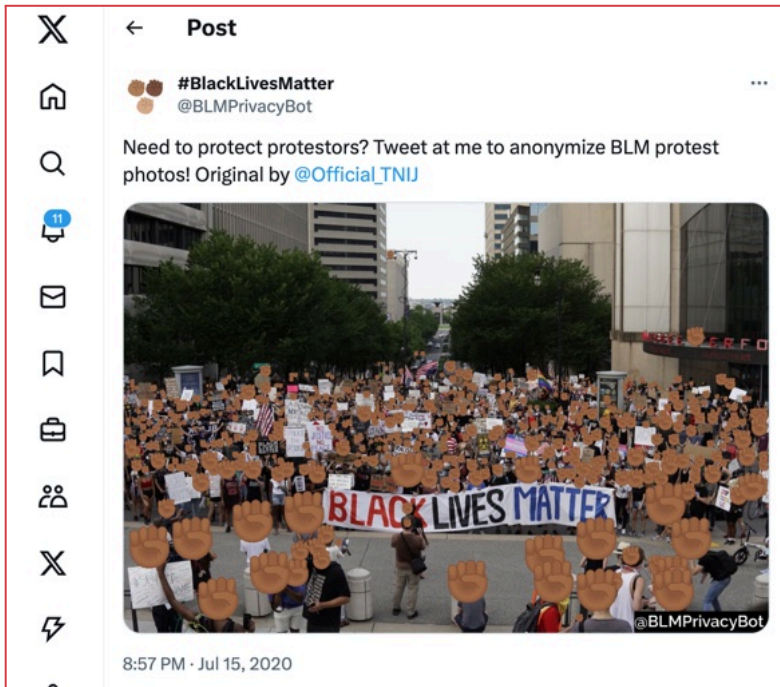
The message that autonomous weapons and AI are too complex to be understood by the broad public not only creates a distance between audiences and the issues discussed in the media. It also establishes a barrier that inhibits democratic participation in decision-making processes and prevents citizens from demanding accountability.

While the nuances and details of technological functioning might be accessible mainly to specialists, non-experts are able to understand the social, ethical, and political implications of technological development. Furthermore, neither AI nor autonomous weapons are ‘magic’. They are made by humans who are specialists, but they can be made accessible to non-specialists as well: by breaking down specific aspects through accessible language and selecting visuals that would not reinforce the artificial barrier.



Screenshot, *International Security Journal*, 2020²⁷.
 Story about facial recognition software launched by Corsight AI.

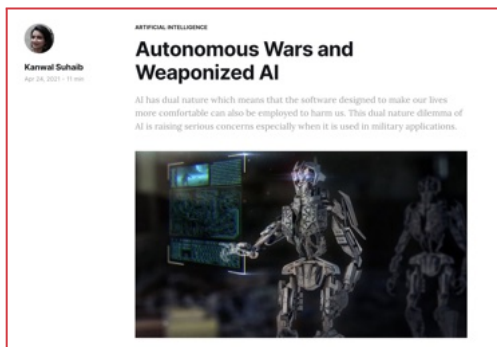
²⁷ Thorpe, J. (2020, November 20). Corsight AI launches state-of-the-art real-time facial recognition technology. *International Security Journal*.
<https://internationalsecurityjournal.com/corsight-ai-facial-recognition/>



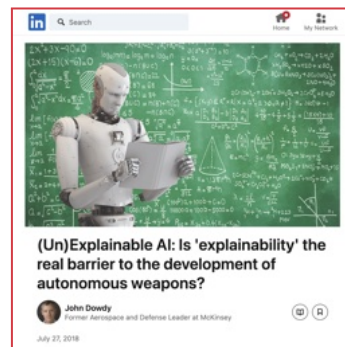
Screenshot, Twitter, 2020²⁸. Researchers from Stanford created an AI-powered “BLM Privacy Bot” that automatically covered the faces of protestors at Black Lives Matter protests.

“AI/Autonomous weapons are human-like.”

Images that perpetuate the myth: Android, anthropomorphic robots, digital avatars, machines with human features, etc.



Screenshot, ThinkML, 2021²⁹



Screenshot, LinkedIn article, 2018³⁰

²⁸ #BlackLivesMatter [@BLMPrivacyBot]. (2020, July 15). Twitter Profile. <https://twitter.com/blmprivacybot>

²⁹ Suhaib, K. (2021, April 24): Autonomous Wars and Weaponized AI. ThinkML. <https://thinkml.ai/autonomous-wars-and-weaponized-ai/>

³⁰ Dowdy, John (2018, July 27): (Un)Explainable AI: Is 'explainability' the real barrier to the development of autonomous weapons? LinkedIn. <https://www.linkedin.com/pulse/unexplainable-ai-explainability-real-barrier-autonomous-john-dowdy/>

Alternative images: imagery that shows AI as a tool instead of an agent on its own, depictions of people working on different parts of what become autonomous weapons - from data labeling and programming to presenting them at military fairs.

Many people believe that AI systems (including autonomous weapons) are becoming more “like humans” in their abilities - with respect to autonomous warfare, it is especially the notion of human-like judgment ascribed to or expected from these machines.

As early as the 1980s, computers were portrayed as active counterparts to humans - actually, people have been ascribing human-like characteristics to machines for the past two centuries (Cugurullo, 2024). However, depicting machines as “agentic”, ascribing them the capacity to act on their own, “erroneously pictures humans out-of-the-loop and autonomous AIs in pursuit of human objectives.” (ibid.) While depicting machines as having human or human-like features might be an ‘easy’ reference allowing audiences to make sense of an AI’s behavior, it actually perpetuates a biased notion and prevents the understanding of underlying processes. Machines do not have emotions or a moral compass, even if they can mimic human behaviors and perception. Instead, their performance is task-specific.

Autonomous weapons follow programmed commands and data inputs. Presenting them in a mystifying, human-like manner, does not only prevent people from understanding what they are indeed capable of doing or not. More importantly, it distracts from more important issues that the public should be aware of, related to the governance of AWS: control and accountability as well as the politics behind the processes in general, including relations of exploitation.

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Artificial Intelligence [+ Add to myFT](#)


AI's new workforce: the data-labelling industry spreads globally

Hundreds of thousands employed in lower-income countries such as India and Philippines



Employees at the offices of the data annotation company iMerit in Kolkata, India. As companies are increasingly embracing artificial intelligence, a growing industry is emerging in which workers are employed to 'train' algorithms to recognise various types of data

algorithms that underpin the technology are as naive as newborns. They need to be fed millions of labelled examples to teach them to "see".



Workers at Samsource, a San Francisco-based data labelling vendor, in Nairobi © Fredrik Lemeryd/FT

For a self-driving car algorithm to be taught the meaning of road signs, or to tell the


such as Sarah T Roberts, who interviewed dozens of tech workers in countries such as the Philippines for her book *Behind the Screen*.



Lella Janak, founder and chief executive of Samsource © Fredrik Lemeryd/FT

As the volume of data that requires labelling has expanded exponentially, large

individual buildings and construction sites, to train risk assessment algorithms for insurance companies, Ms Basu said.



Workers at iMerit in Kolkata

Samsource worked on a project for Bayer that required annotating vascular cross-sections of plants to detect diseased cells for gene mutation, to train an artificial

Screenshots, *Financial Times*, 2019³¹. Images from a story on people working in the data-labelling industry in India, Kenya, and the Philippines.

³¹ Murgia, M. (2019, July 24). AI's new workforce: the data-labelling industry spreads globally. *Financial Times*. <https://www.ft.com/content/56dde36c-aa40-11e9-984c-fac8325aaa04>

“Autonomous weapons operate rationally, without error, and will be able to do anything.”

Images that perpetuate the myth: mathematical symbols, descending code, futuristic landscapes, shiny robots, humanoids, and machines, etc.



Screenshot, Landing page of the Responsible AI in the Military Domain Summit 2023, The Hague/Netherlands³².



Screenshot, Landing page of the Responsible AI in the Military Domain Summit 2024, Seoul/Republic of Korea³³.

Alternative images: visualizations of ‘AI gone wrong’ and algorithmic bias, errors in different features, parallels to the use of AI in everyday life and unexpected results; Images of protesters and interventions.

Debates around autonomous weapon systems suggest that it is only a matter of time - and technology - until these weapons will be able to function perfectly and without error, in order to be used in conflicts and wars. They are expected to limit civilian casualties and avoid any flaws of human judgment, making wars not only more ethical but also more precise and ultimately more sterile. This narrative perpetuates overconfidence in the weapons themselves and neglects the current capabilities of AI-driven systems, imagining them as superior to human decision-making.

However, just like other AI systems, autonomous weapon systems rely on algorithms which are trained on the basis of data that is provided to them. Therefore, they are dependent on the quality of data. These data, however, are not neutral and far from perfect - they have the assumptions, prejudices and biases of humans ingrained in them, a

³² <https://reaim2023.org/>

³³ <https://www.reaim2024.kr/reaimeng/index.do>

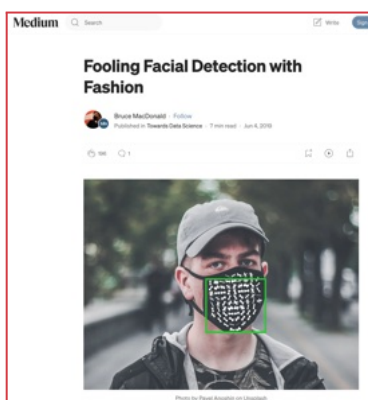
phenomenon subsumed under ‘algorithm bias’. Facial recognition systems, crucial for identifying potential targets, have difficulties recognizing faces from diverse populations - they struggle with skin tones, facial features and different environments. Moreover, these systems can be tricked - wearing deceptive clothing or clothes that feature prints of faces has been proven to disable their capabilities. Protesters have used simple tactics to prove that algorithms are not perfect.



Screenshot, The World, 2020³⁴.



Screenshot, CNN, 2019³⁵.



Screenshot, Medium, 2019³⁶.



Screenshot, Smithsonian Magazine, 2013³⁷.

Examples of protesters and activists using simple methods to avoid being recognized by facial recognition software.

Machines also lack the ability to adapt to changing situations - which is particularly problematic in the ever-changing conditions of war and

³⁴ Barry, O. (2020, March 2). London’s Dazzle Club uses makeup to protest police use of facial recognition technology. The World.

<https://theworld.org/stories/2020/03/02/londons-dazzle-club-uses-makeup-protest-police-facial-recognition-technology>

³⁵ Gotkine, E. (2023, January 16): Fed up with facial recognition cameras monitoring your every move? Italian fashion may have the answer. CNN.

<https://edition.cnn.com/2023/01/16/tech/facial-recognition-fashion/index.html>

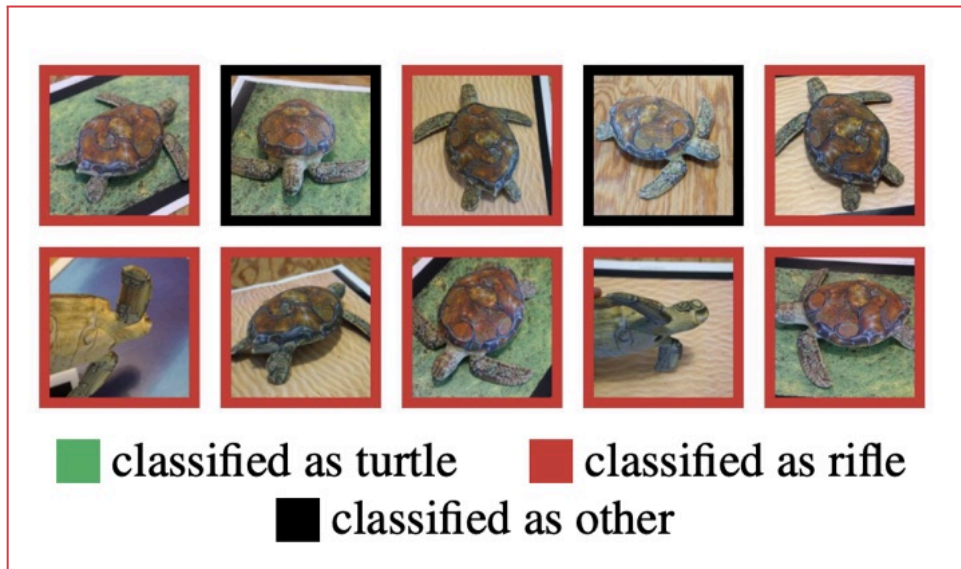
³⁶ MacDonald, B. (2019, June 4). Fooling Facial Detection with Fashion. Medium.

<https://towardsdatascience.com/fooling-facial-detection-with-fashion-d668ed919eb>

³⁷ Stamp, J. (2013, February 6). The Privacy Wars: Goggles That Block Facial Recognition Technology. Smithsonian Magazine.

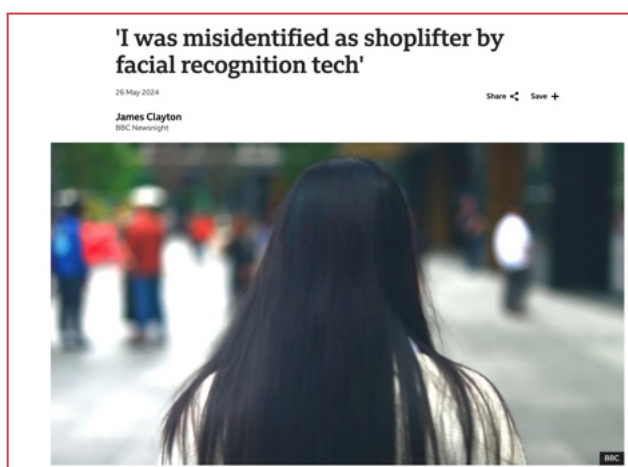
<https://www.smithsonianmag.com/arts-culture/the-privacy-wars-goggles-that-block-facial-recognition-technology-12751519/>

conflicts. Combined with the possibility of error, the consequences can be and will be lethal.



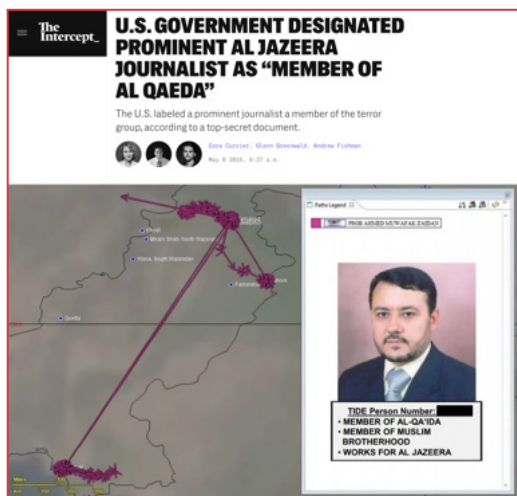
AI falsely classifying a 3D-printed turtle as a rifle (Athalye et al., 2018).

Another false assumption in this context is the expectation that humans can perfectly code machines with fairness and ethical behavior - and that they will refrain from feeding them with unfair or inhumane instructions. However, machines can be programmed to be harmful. Technologies can be created for malicious purposes. Therefore, strict regulations are necessary - both with respect to artificial intelligence as such as well as, more importantly, in relation to autonomous weapons systems.



Screenshot, BBC, 2024³⁸.

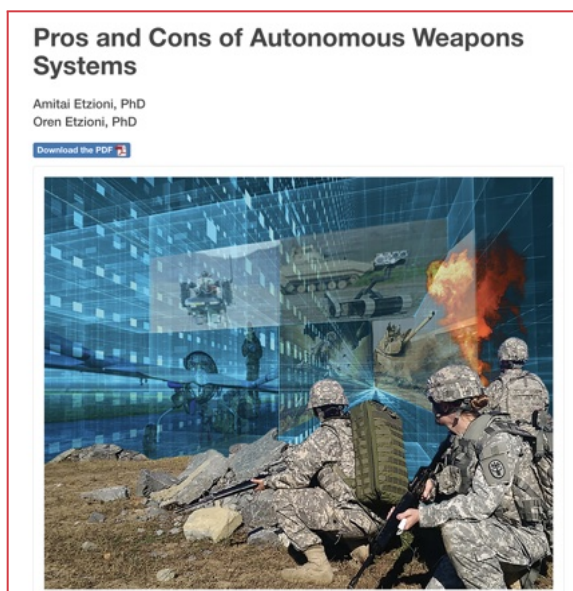
³⁸ Clayton, J. (2024, May 26): 'I was misidentified as shoplifter by facial recognition tech'. BBC Newsnight.
<https://www.bbc.com/news/technology-69055945>



Screenshot, *The Intercept*, 2015³⁹. Story about Syrian Journalist Ahmad Zeidan, labeled by the US government as a terrorist due to patterns in his travel data reflecting the movement patterns of Al Qaeda members. Zeidan has reported on the Taliban and Al Qaeda for Al Jazeera.

“Autonomous Weapons are used in a different world.”

Images that perpetuate the myth: sci-fi settings and futuristic weapons, robotic soldiers in fantasy battles, etc.



Screenshot, *Army University Press*, 2017⁴⁰.

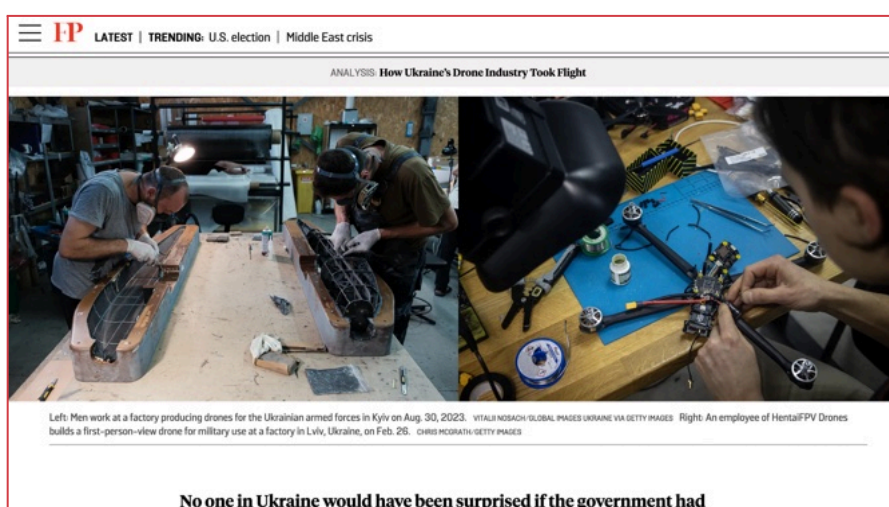
³⁹ Currier, C. et al. (2015, May 8): U.S. Government Designated Prominent Al Jazeera Journalist as “Member of Al Qaeda”. *The Intercept*. <https://theintercept.com/2015/05/08/u-s-government-designated-prominent-al-jazeera-journalist-al-qaeda-member-put-watch-list/>

⁴⁰ Etzioni, A. & Etzioni, E. (2017, June): *Pros and Cons of Autonomous Weapons Systems*. Army University Press. <https://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/May-June-2017/Pros-and-Cons-of-Autonomous-Weapons-Systems/>

Alternative images: the manufacturing of components, depiction of weapons in recognizable elements, images showing the effects of autonomous technology in current contexts (in real environments and on real people). Showing different contexts: destruction being done through weapons with autonomous elements, borders being controlled, people being targeted. Showing actors of resistance, their actions and its effects - and telling their stories. Showing the more conventional elements of autonomous weapons - placed in the real world.

Autonomous weapons are depicted so abstractly and out of context that they almost seem surreal. However, weapons with autonomous elements are already being deployed and have very real consequences – they kill and destroy actual people and cities. Futuristic images feed the perception that autonomous weapons belong to an abstract, distant, or dystopian future - or to remote battlefields. They remove the issue from everyday reality and nurture detachment and alienation in audiences. However, AWS are already shaping our present societies. They impact military strategies and international law and have material effects on civilian safety. Examples can be drawn from current wars and military conflicts.

Perpetuating this myth prevents public engagement and demands for regulatory action. Instead, audiences should be provided with images that translate the relevance of autonomous weapons into fields that they are familiar with and that are part of their everyday lives.



Screenshot, *Foreign Policy*, 2024⁴¹. Workers manufacturing drones in Ukraine.

⁴¹ Jacoby, T. (2024, July 6): How Ukraine's Drone Industry Took Flight. *Foreign Policy*.

<https://foreignpolicy.com/2024/07/06/ukraine-drone-industry-russia-war-regulation/>

“Autonomous weapons: the exciting boy-dream of (white) men come true”

Images that perpetuate the myth: excited, mostly white & male developers ‘playing’ with drones; mostly white & male participants at weapons fairs, etc. Descending code, aestheticized images relating to AI; images replicating the aesthetics of video games and action movies.

The conference also had a VR simulator where attendees could practice firing a wireless rocket launcher at old farmhouses. Sadly, Business Insider didn't get to have a go.

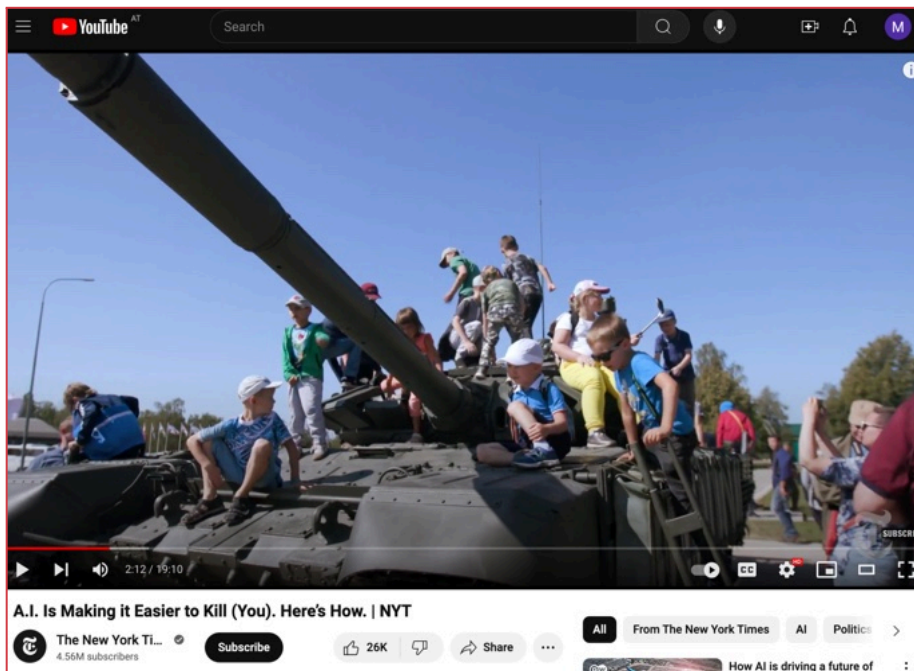


A man practices firing a rocket-launcher using an RVT VR simulator. Bill Bostock/Business Insider

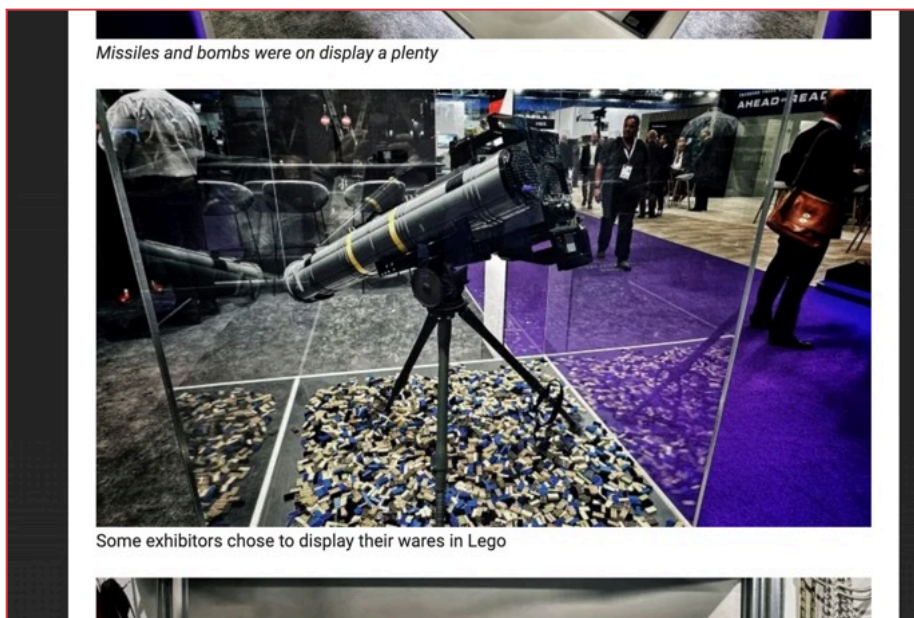
Screenshot, *Business Insider*, 2019⁴². Image from London Arms Fair, Defence & Security Equipment International (DSEI). Note the title, which includes the sentence: “Sadly, Business Insider didn’t get to have a go.”

⁴² Bostock, B. (2019, September 12). Here's what's it's like inside the world's largest arms fair, where uniformed military officials survey the latest weapons and vehicles from the biggest names in the defense industry. *Business Insider*.

<https://www.businessinsider.com/future-warfare-tech-worlds-largest-arms-fair-dsei-2019-9>



Still from a video clip of the New York Times about autonomous weapons, depicting children playing on top of a tank at a Russian arms fair.⁴³



Screenshot, *Action on Armed Violence, 2023*⁴⁴. Image shows weapons displayed in Lego stones at London Arms Fair.

⁴³ New York Times (2019, December 13). A.I. Is Making it Easier to Kill (You). Here's How. | NYT [Video]. https://youtu.be/GFD_Cgr2zho?si=gmjMvbdcapF3cUVX

⁴⁴ Action on Armed Violence (2023, Sep 15): Inside Europe's Largest Arms Fair: AOV went to see what's on sale. <https://aoav.org.uk/2023/inside-europes-largest-arms-fair-aoav-went-to-see-whats-on-sale/>

Alternative images: imagers featuring diverse groups of people in diverse contexts (gender, race, global location, etc.); people engaged in activism and in dialogue; real-world impact of technologies on civilian populations, especially in conflict and war; images of humanitarian workers, peace activists. Images ridiculing the fetishising elements of current discourse.



Stop the Arms Fair UK: Protesters blocking the entrance to the Defence & Security Equipment International arms fair in London, 2013⁴⁵.

Autonomous weapon systems nourish militaristic fantasies that are highly gendered and racialized. It is mostly men who are shown developing them, it is mostly men who are shown testing or promoting them. The excitement these individuals often show when speaking about the weapons or when operating them uncovers fantasies they are linked with. Research has proven that similar fantasies are activated when soldiers operate drones in attacks, even lethal ones: “It’s like a video game. It can get a little bloodthirsty. But it’s fucking cool.” (Singer, 2009, pp. 308-309, quoted in Sharkey, 2010) Similarly, autonomous weapons are often depicted as ‘cool’ and ‘masculine’ - presented as fascinating high-tech toys. This narrative does not only perpetuate gendered and racial biases of the tech sector (after all, most robots are ‘white’ and ‘masculine’ unless they are explicitly programmed to ‘serve’), but also negates any ethical

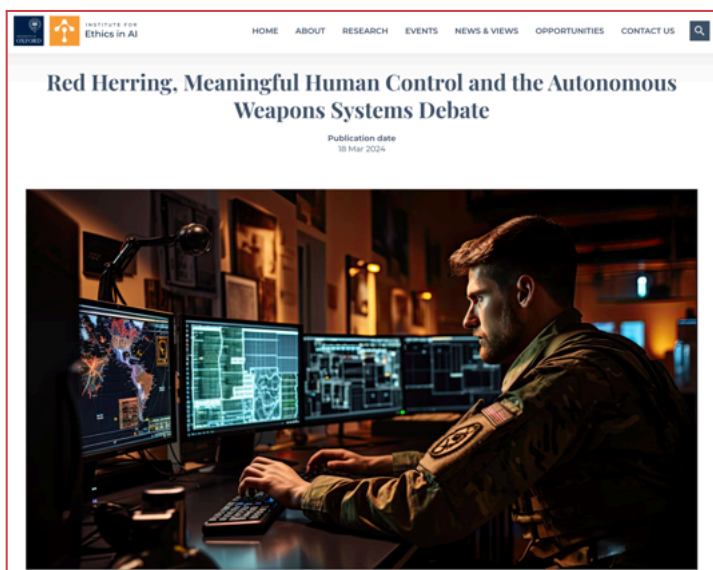
⁴⁵ Stop the Arms Fair UK, 2013. <https://stopthearmsfair.org.uk/about/>

questions or implications with respect to international law. Autonomous weapons are far from being toys. They are tools of lethal force that can cause significant harm in ways that can be expected to disproportionately affect people from marginalized groups and communities - in conflict zones and beyond.

Images of (mostly white and) male soldiers can be seen as the equivalent of a white, shiny robot: the white, male soldier is the only actor depicted. He becomes the only relevant human being - while those who are his potential targets are invisibilized. Similarly, racialized and gendered notions of AI render all those invisible who also contribute to the industry, providing their labor (or their data), and are impacted by the technological developments - such as women, people of color, people in the Global South. One strategy to counter such biases is to name them - white robots or the color blue do not represent neutrality but rather specific understandings of technology and its impacts. They stem from a specific perspective, at the cost of all other perspectives.

“Ethics are a matter of proper programming.”

Images that perpetuate the myth: images of code visualizing stories about ethics, depictions of graphs or equations, abstract images of programmers.



Screenshot, *Institute for Ethics in AI, University of Oxford, 2024*⁴⁶.

⁴⁶ Shany, Y. (2024, March 18). Red Herring, Meaningful Human Control and the Autonomous Weapons Systems Debate. <https://www.oxford-aiethics.ox.ac.uk/blog/red-herring-meaningful-human-control-and-autonomous-weapons-systems-debate>

Alternative images: concrete individuals involved in ethical decisions, activists, workers, concrete people affected by deployment of weapons with autonomous elements; images showing differences in access to AI and actors and initiatives working towards equitable access.

The issue of alignment (how AI can be ‘aligned with’ ethical values) is often presented as a matter of ‘better’ programming. This supports the myth that the ethical challenge that autonomous weapons pose can be ‘solved’ through more advanced algorithms, encoding ethics into machines. However, ethical questions are highly contested and rarely correspond to binary choices. They are shaped by other societal debates, norms, and contested values. While ethical guidelines are useful, they do not resolve the fundamental questions of responsibility and accountability pertaining to the use of autonomous weapon systems. Ethical decisions require nuanced judgment and handling contradictions - while contemporary algorithms fail even when asked to distinguish between ‘friends’ and ‘enemies’ (Moses & Ford, 2024).

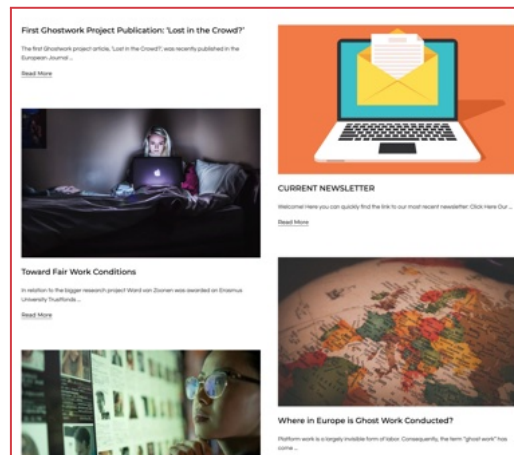
We argue that ethical questions are also sidelined when humanoid robots dominate visual communication - they nurture the false expectations of both AI and autonomous weapons to make human-like moral judgments. At the same time, the ‘autonomous’ element in a weapon might be only a trigger or another component of low complexity.

Moreover, when debates around alignment are restricted to technological and philosophical questions (How can autonomous weapon systems make the ‘best’ ethical choice and what is good/bad in this context?), they project the impact on humans to the future. The humans already impacted and harmed by technological development are ignored and thus not included in the image. Moreover, algorithmic bias does play a role in this context as well.

Finally, technologies require the extraction of resources and the manufacturing of components, such as chips. Including these processes - and the people working on them - in the stories is another possibility to humanize the issue of autonomous weapons and extend the scope of any discussion of ethics. Workers in the chip industry - both in the Global North (such as the US) and in the Global South - rarely make living wages and often work under unsafe working conditions. Many individuals and organizations are involved in the struggle for better working conditions - which can be illustrated by appropriate visuals. They demand better labor standards and rights and participate in public action campaigns. However, even stories about the exploitation of workers are most often illustrated with abstract imagery.



Screenshot, *The Guardian*, 2024⁴⁷.



Screenshot, *Ghostwork*, 2024⁴⁸.

A similar trend can be observed with respect to so-called 'ghost workers' or 'clickworkers', who perform tasks that help train artificial intelligence, usually far below minimum wage and without any securities. Their exploitation mirrors the power relationships manifesting in other contexts: those with less power work to create/program/assemble devices that they might not only never benefit from, but that might be used to kill them or those in their communities.

⁴⁷ Sainato, M. (2024, August 5): US chip factory workers say it's a 'struggle to survive on their wages as industry booms. *The Guardian*.
<https://www.theguardian.com/business/article/2024/aug/05/chip-factory-workers-wages>

⁴⁸ Ghostwork.com is a page that advocates for the rights of so-called 'ghost workers' and includes a map that shows where in Europe such workers are located. The page relies on stock images for illustration. <https://www.ghostwork.org/updates/>

Broadening the Picture: Humanize, Politicize, Irritate

The aim of selecting alternative images for visualizing autonomous weapons systems is to address their ethical and societal dimensions. Images accompanying stories should not only make the issue at hand recognizable. They should contribute to the understanding of the problem. Currently, too much emphasis is placed on the technology itself - as well as the abstract hopes and fears projected onto it. The 'human element' remains invisible: people are rarely to be found on the images. To influence the public perception and contribute to a more nuanced understanding of autonomous weapon systems and all their implications, visual communication needs to encompass a broader spectrum of images. We suggest to follow three paths: humanize, politicize, and - when possible and appropriate - irritate.

a) Humanize the (visual) narrative

The first and most important step: include people.

Include people from diverse contexts and backgrounds, from different fields related to the development, manufacturing, policy-making and negotiating around autonomous weapon systems. When AWS are discussed, the notion of "humans-in-the-loop" refers to the human control involved in operating or controlling technologies. We suggest that there are actually many more humans 'in the loop' - people whose lives are impacted by AI and autonomous weapons: among them civilians in war zones, social groups disproportionately targeted by biased algorithmic systems, workers exploited for the benefit of the weapons industry. While the issue of autonomous weapons might seem distant from the lived realities of lay audiences, it is actually much more entrenched with their lives - and it is these connections that can be used for visualizing aspects of the problem.

Not including people in images prevents understanding the issue in its full scope. There is a need for visuals depicting how AI and autonomous weapons affect real people in concrete ways. Instead of abstract concepts or futuristic imagery, the public needs images that show the issues as part of their lived experience - even if further explanation is necessary.

b) Politicize the issue

The development and deployment of autonomous weapon systems is not a neutral, technical issue. Weapons are a political and politicized issue, as is artificial intelligence. Specific actors (governments, corporations, militaries) have specific interest in developing and using these technologies. It is their decisions that have impact - and these decisions are the result of striving for power, profit, or control. Audiences need visual support for understanding these dynamics - they need to see that these are real issues relating to real processes perpetuated by the decisions and actions of real people, actors, and stakeholders. Furthermore, there are actors protesting against and disturbing these processes - activists, grassroots movements, civil society organizations, or affected communities. They use various means to express and position themselves - in relation to both algorithmic technologies as well as the development and deployment of weapons. Furthermore, there are people and communities impacted by the use of weapon systems - and dealing with these impacts. All of these people can be shown in order to complicate the image - and explain the politics behind it.

c) Whenever possible: Irritate the audiences

If audiences are confronted with always the same imagery, they might recognize the issue that is being debated, but they are neither challenged nor surprised. Dominant imagery is not only boring, it also has no informational value and serves to sustain the status quo. Unusual images (such as those collected by the initiative *Better Images for AI*), activist or artistic interventions, responses by affected communities, thought-provoking juxtapositions and comparison, images illustrating historical parallels (while explaining the differences in the contexts) or visuals depicting the contradictions of AI can serve to challenge the viewers' expectations.

If what we are talking about - fully autonomous weapon systems - is not yet possible to be fully visualized - we can draw on unexpected comparisons and images that might depict similar consequences or contexts. Such images can draw attention to the stories - and broaden the possibilities of thinking about the issue(s).

(More) Examples of images that humanize, politicize, and irritate



Screenshot, *Not a Bug Splat*, landing page: "A giant art installation targets predator drone operators"⁴⁹



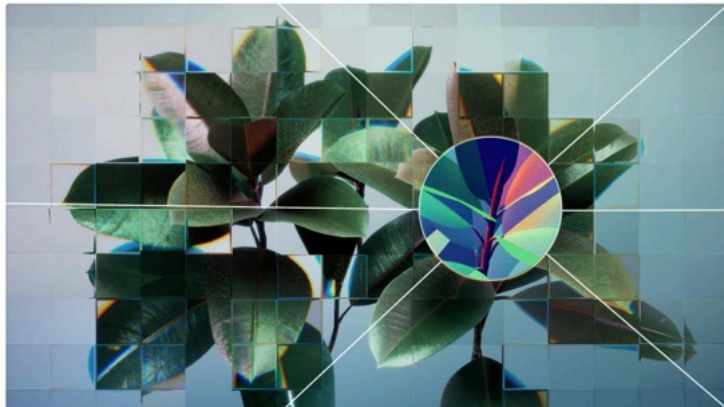
Screenshot, *AutoNorms*, 2024⁵⁰.

⁴⁹ <https://notabugsplat.com/> The Pakistani-US-American-French collective art project #NotABugSplat created huge images of Pakistani children who were killed by drone attacks or lost their families on fields so that they could be 'viewed' by drones from above (see also Benjamin, 2022).

⁵⁰ Nadibaidze, A. (2024, March 18). 'Traditional Values': The Russian Leadership's Narrative about Generative AI. *AutoNorms*. Featured image credit: Russian stamps in honour of the Year of Science and Technology, Post of Russia 2021, public domain. <https://www.autonorms.eu/traditional-values-the-russian-leaderships-narrative-about-generative-ai/>

Five Questions We Often Get Asked About AI in Weapon Systems and Our Answers

Anna Nadibaidze
September 25, 2023



By Anna Nadibaidze and Ingvild Bode

Screenshot, *AutoNorms*, 2023⁵¹.



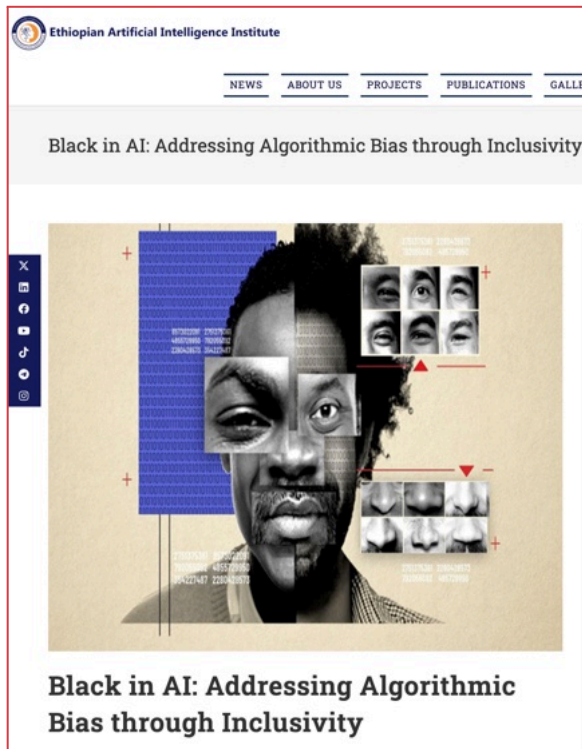
Screenshot, *BBC, Explaining Artificial Intelligence*, 2021⁵².

⁵¹ Nadibaidze, A. & Bode, I. (2023, September 25). Five Questions We Often Get Asked About AI in Weapon Systems and Our Answers. Featured image credit: Alan Warburton / © BBC / Better Images of AI / Plant / CC-BY 4.0

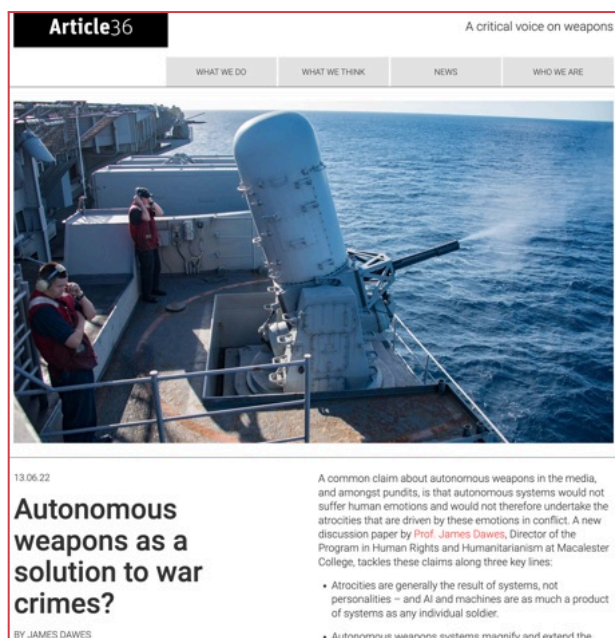
<https://www.autonorms.eu/five-questions-we-often-get-asked-about-ai-in-weapon-systems/>

⁵² Ferne, T. et al. (2021, August 16): Explaining Artificial Intelligence. Part 3 - what does AI look like?

<https://www.bbc.co.uk/rd/blog/2021-08-explaining-artificial-intelligence-part-3-what-does-ai-look-like> -



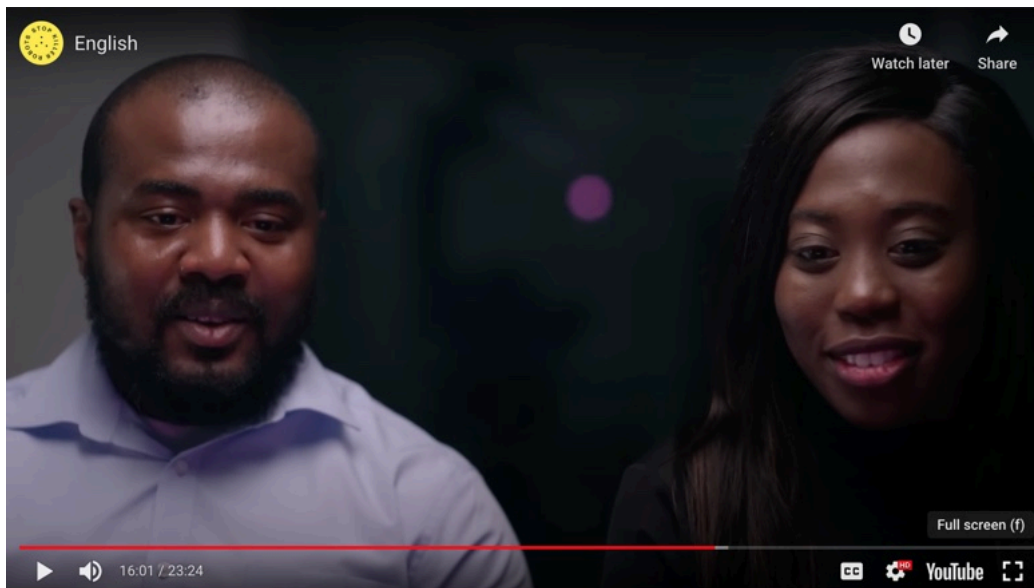
Screenshot, Ethiopian Artificial Intelligence Institute, 2024⁵³.



Screenshot, Article36, 2022⁵⁴.

⁵³ Ethiopian Artificial Intelligence Institute (2024, August 8). Black in AI: Addressing Algorithmic Bias through Inclusivity. <https://www.aii.et/black-in-ai-addressing-algorithmic-bias-through-inclusivity/>

⁵⁴ Dawes, J. (2022, June 13): Autonomous weapons as a solution to war crimes? Article36. <https://article36.org/updates/publication/autonomous-weapons-as-a-solution-to-war-crimes/>



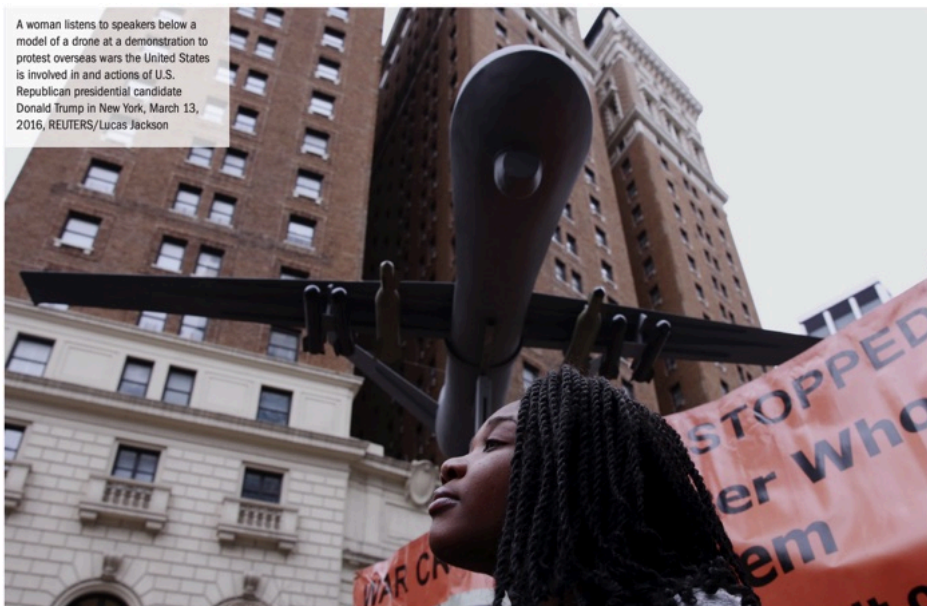
Still from the documentary “Immoral Code”, Campaign to Stop Killer Robots, 2023⁵⁵. The film includes lay people discussing ethics in relation to autonomous weapons.



Screenshot from Article36 Briefing Paper, 2018. Caption: “Nabila Rehman, 9, holds up a picture she drew depicting the U.S. drone strike on her Pakistan village which killed her grandmother Mammama Bibi, at a news conference on Capitol Hill in Washington, October 29, 2013. REUTERS/Jason.”⁵⁶

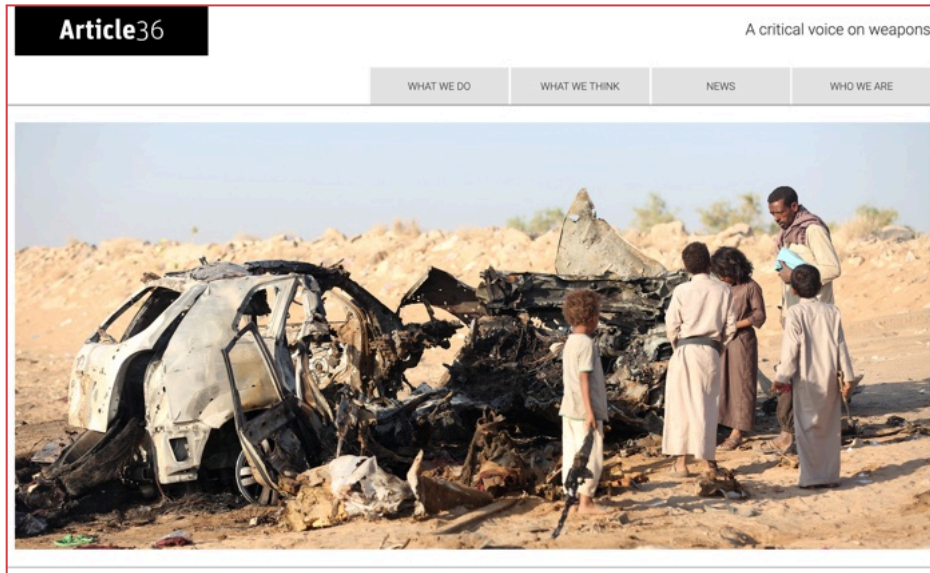
⁵⁵ Harmer, M. (Director). 2023. *Immoral Code* [Film]. Stop Killer Robots. United Kingdom. https://youtu.be/xUU8YHa_Cjg?si=0tMNoTa3EBnWn54z

⁵⁶ Article36 (2018, October). Drones in the Use of Force: A Way Forward. Briefing Paper. p. 1. <https://article36.org/wp-content/uploads/2018/10/A36-drones-use-of-force-way-forward-1.pdf>



A woman listens to speakers below a model of a drone at a demonstration to protest overseas wars the United States is involved in and actions of U.S. Republican presidential candidate Donald Trump in New York, March 13, 2016, REUTERS/Lucas Jackson

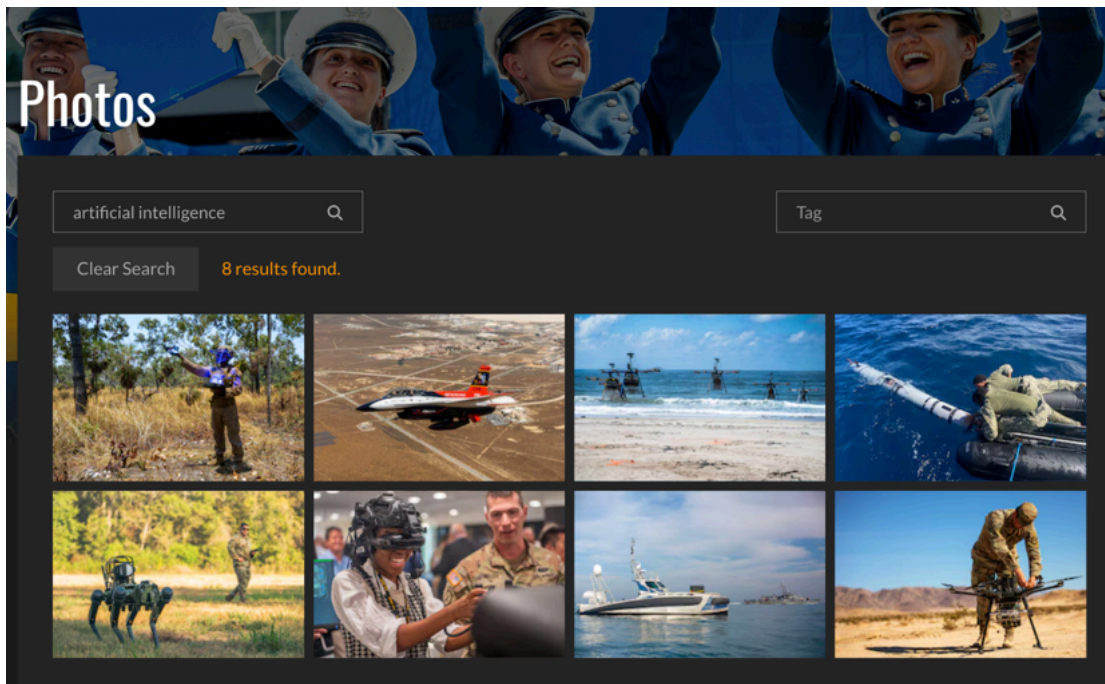
Screenshot from Article36 Briefing Paper, 2018. Image caption & credit: "A woman listens to speakers below a model of a drone at a demonstration to protest overseas wars the United States is involved in and actions of U.S. Republican presidential candidate Donald Trump in New York, March 13, 2016, REUTERS/Lucas Jackson."⁵⁷



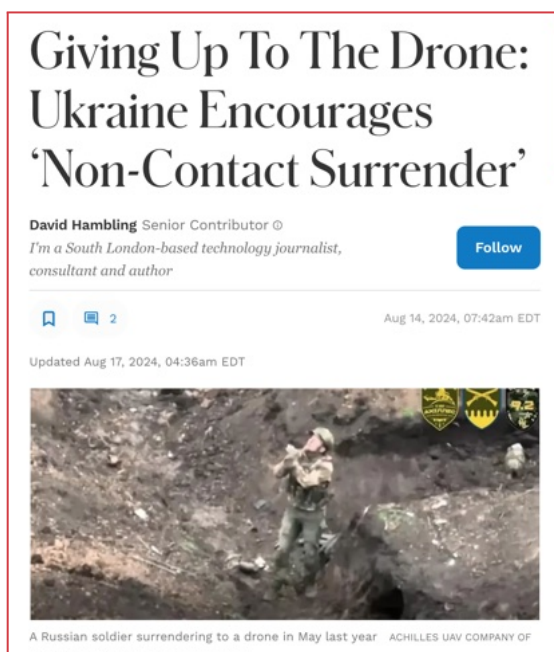
Screenshot, Article36, 2018⁵⁸. Image caption & credit: "People inspect the wreckage of a car hit by a drone air strike near the northern city of Marib, Yemen November 3, 2017. REUTERS/Ali Owidha."

⁵⁷ Article36 (2018, October): Approaches to Technology and Policy. International Standards and Addressing Drones in the Use of Force. Briefing Paper. p. 5. <https://article36.org/wp-content/uploads/2018/10/A36-approaches-to-tech-policy-drones.pdf>

⁵⁸ Minor, E. (2018, June 16). Article for the Journal of the Oxford Centre for Socio-Legal Studies on armed drones. <https://article36.org/updates/targeting-legality-article/>



Screenshot, US Department of Defense Multimedia Database, search prompt “artificial intelligence”⁵⁹.



Screenshot, Forbes, 2024⁶⁰. Image depicting Russian soldier surrendering to a Ukrainian drone in 2023.

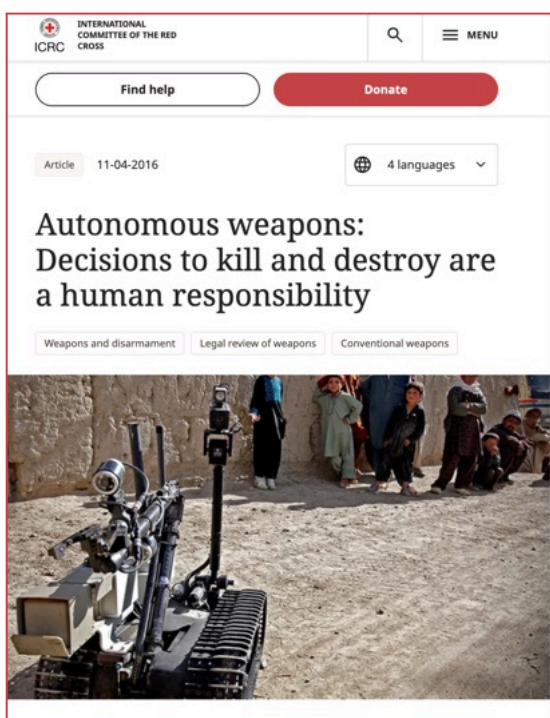
⁵⁹ <https://www.defense.gov/Multimedia/Photos/>

⁶⁰ Hambling, D. (2024, August 17). Giving Up To The Drone: Ukraine Encourages 'Non-Contact Surrender'. Forbes.

<https://www.forbes.com/sites/davidhambling/2024/08/14/giving-up-to-the-drone-ukraine-encourages-non-contact-surrender/>



Screenshot, *Business Insider*, 2022⁶¹. Article features stills from Ukrainian instructional video for Russian soldiers, demonstrating how to surrender to a drone.

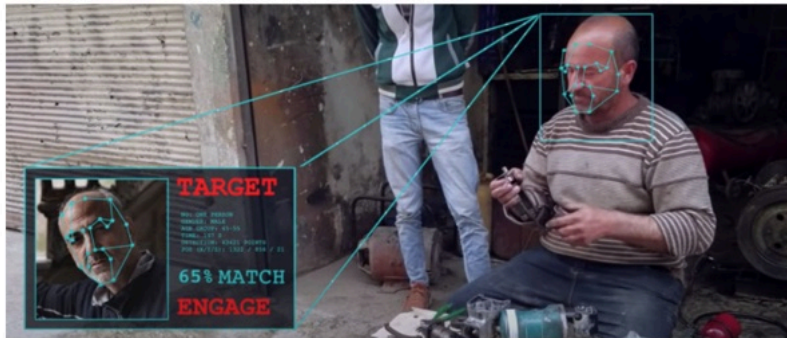


Screenshot, *ICRC*, 2016⁶².

⁶¹ Jankowicz, M. (2022, December 13). Ukrainian army issues instructional video telling Russians how to surrender to a drone. *Business Insider*. <https://www.businessinsider.com/ukraine-army-video-tells-russians-how-to-surrender-to-drone-2022-12>

⁶² International Committee of the Red Cross (2016, April 11). Autonomous weapons: Decisions to kill and destroy are a human responsibility. <https://www.icrc.org/en/document/statement-icrc-lethal-autonomous-weapons-systems>

For example, this could be the shape of a military vehicle or the movement of a person. It is the vehicle or the victim that triggers the strike, not the user.




Our concern with this process is the loss of human judgement in the use of force. It makes it difficult to control the effects of these weapons.

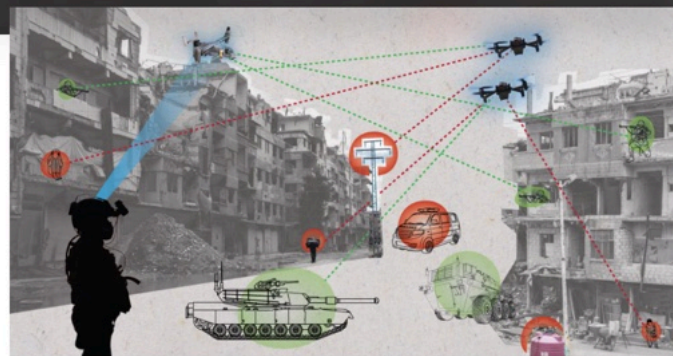
Screenshot, ICRC, 2022⁶³. Image visualizing automatic target identification in an article explaining the background and functions of autonomous weapons.

Algorithms of war: The use of artificial intelligence in decision making in armed conflict

October 24, 2023, Artificial Intelligence and Armed Conflict / Autonomous Weapons / Humanitarian Action / New Technologies / Technology in Humanitarian Action
14 mins read

 **Ruben Stewart**
Military and Armed Group Adviser, ICRC

 **Georgia Hinds**
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Screenshot, ICRC Blog on Humanitarian Law & Policy, 2023⁶⁴. Image visualizing the use of AI-powered targeting in conflict.

⁶³ International Committee of the Red Cross (2022, July 27). What you need to know about autonomous weapons.

<https://www.icrc.org/en/document/what-you-need-know-about-autonomous-weapons>

⁶⁴ Stewart, R. & Hinds, G. (2023, October 24). Algorithms of war: The use of artificial intelligence in decision making in armed conflict. ICRC, Humanitarian Law & Policy. <https://blogs.icrc.org/law-and-policy/2023/10/24/algorithms-of-war-use-of-artificial-intelligence-decision-making-armed-conflict/>

Conclusion

Our analysis of visual narratives around autonomous weapon systems revealed that many publications and media stories feature a small number of clichéd tropes. These derive mainly from the public imaginations of artificial intelligence, draw on science fiction inspired references to popular culture and similar tropes as well as on a narrow range of representations from a military context.

We identified dominant patterns that featured abstract, futuristic, and imaginary depictions, which might allow audiences to quickly identify the issue at hand ('something to do with AI and war') but effectively prevent them from engaging with the issue - as well as with related policy-making and questions of governance and regulation - in meaningful ways. Dominant patterns of representation thus effectively hinder the public in developing ways of engagement and public deliberation with respect to the development and deployment of autonomous weapon systems. They detach audiences from real-world social and political contexts of AWS and weapons development in general. They reinforce the notion that AWS are a purely technical/technological issue and perpetuate several related myths. Furthermore, the limited diversity in the imagery selected over and over disconnects large parts of viewers from the issue and alienates them.

Therefore, we recommend three parallel strategies for diversifying the visuals selected to accompany stories about AWS: humanize, politicize, irritate. It is mainly humans that are absent from the dominant visuals - whereby the dominant discourse around AWS seems to imply that 'regular people' are not impacted. This is far from true - not only do AWS pose a threat to humanity overall, they are also developed, manufactured, tested and potentially deployed by concrete humans - to target other concrete humans. It is concrete humans who profit from these processes and others who are exploited in their course.

Including diverse human actors - those involved in developing and regulating these systems as well as the communities affected by them (or by similar, if not comparable technologies) will help shift the focus on the regulation and governance of AWS. Moreover, by including visuals that irritate audiences and challenge their expectations, journalists can attract the attention of viewers and use it to raise awareness on the complexities in the field.

Finding images: Commissioning visual stories

Therefore: If you have the opportunity, commission stories. This allows for breaking out of the broad visual discourse and equipping often overlooked stories with the appropriate images and videos.

More diverse voices are needed for telling these complex stories. Make use of companies such as fairpicture.org, which can organize assignments with local creators who are familiar with the contexts and the history of nuclear impacts in their region and speak the local languages. Context and ethical storytelling practices are key in the ambition to create a more holistic image.

References

- Athalye, A., Engstrom, L., Ilyas, A., & Kwok, K. (2018, July). Synthesizing robust adversarial examples. *International Conference on Machine Learning* (pp. 284-293). PMLR.
<https://proceedings.mlr.press/v80/athalye18b/athalye18b.pdf>
- Benjamin, G. (2022). Drone culture: Perspectives on autonomy and anonymity. *AI & Society*, 37(2), 635-645.
- Bhuta, N., Beck, S., & Liu, H. Y. (Eds., 2016). *Autonomous Weapons Systems: Law, Ethics, Policy*. Cambridge University Press.
- Bode, I., & Huelss, H. (2022). *Autonomous Weapons Systems and International Norms*. McGill-Queen's University Press.
- Bode, I., Huelss, H., Nadibaidze, A., Qiao-Franco, G., & Watts, T. F. A. (2023a). Algorithmic warfare: Taking stock of a research programme. *Global Society*, 38(1), 1-23.
- Bode, I., Huelss, H., Nadibaidze, A., Qiao-Franco, G., & Watts, T. F. A. (2023b). Prospects for the global governance of autonomous weapons: Comparing Chinese, Russian, and US practices. *Ethics and Information Technology*, 25(1), Article 5.
- Carpenter, C. (2016). Rethinking the political/-science-/fiction nexus: Global policy making and the campaign to stop killer robots. *Perspectives on Politics*, 14(1), 53-69.
- Cronin, A. K. (2023). How private tech companies are reshaping great power competition. *The Kissinger Center Papers*.
<https://mediahost.sais-jhu.edu/saismedia/media/web/files/kissinger/how-private-tech-companies-are-reshaping-great-power.pdf>
- Cugurullo, F. (2024). The obscure politics of artificial intelligence: A Marxian socio-technical critique of the AI alignment problem thesis. *AI and Ethics*, 1-13.
- Dihal, K., & Duarte, T. (2023). *Better images of AI: A guide for users and creators*. Cambridge and London: The Leverhulme Centre for the Future of Intelligence and We and AI.
<https://blog.betterimagesofai.org/wp-content/uploads/2023/02/Better-Images-of-AI-Guide-Feb-23.pdf>
- Garcia, D. (2024). *The AI Military Race: Common Good Governance in the Age of Artificial Intelligence*. Oxford University Press.

- Gibson, R. (2024). *Cyborgs, ethics, and the Matrix: Simulations of sex and gender*. Springer Nature.
- González, R. J. (2022). *War virtually: The Quest to automate conflict, militarize data, and predict the future*. Univ of California Press.
- Gow, J. et al. (Eds., 2019). *Routledge Handbook of War, Law and Technology* (Vol. 5). Routledge.
- Gruszczak, A., & Kaempf, S. (Eds.). (2023). *Routledge Handbook of the Future of Warfare* (Vol. 1). Routledge.
- Holland Michel, A. (2024, August 6). 'I'm afraid I can't do that': Should killer robots be allowed to disobey orders? *Bulletin of the Atomic Scientists*.
<https://thebulletin.org/2024/08/im-afraid-i-cant-do-that-should-killer-robots-be-allowed-to-disobey-orders/>
- International Committee of the Red Cross. (2021). *ICRC position on autonomous weapon systems and background paper*.
https://www.icrc.org/sites/default/files/document_new/file_list/icrc_position_on_aws_and_background_paper.pdf
- Lavazza, A., & Farina, M. (2023). Leveraging autonomous weapon systems: Realism and humanitarianism in modern warfare. *Technology in Society*, 74, (102322). <https://doi.org/10.1016/j.techsoc.2023.102322>
- Leys, N. (2018). Autonomous weapon systems and international crises. *Strategic Studies Quarterly*, 12(1), 48-73.
- Longpre, S., Storm, M., & Shah, R. (2022). Lethal autonomous weapons systems & artificial intelligence: Trends, challenges, and policies. Edited by Kevin McDermott. *MIT Science Policy Review*, 3, 47-56.
- Mauri, D. (2022). *Autonomous Weapons Systems and the Protection of the Human Person: an International Law Analysis*. Edward Elgar Publishing.
- McFarland, T. (2020). *Autonomous Weapon Systems and the Law of Armed Conflict: Compatibility with International Humanitarian Law*. Cambridge University Press.
- Monnett, L. (2024). *Sending up a flare: Autonomous weapons systems. Proliferation risks to human rights and international security*. Research Brief. Geneva Academy of International Humanitarian Law and Human Rights.
<https://www.geneva-academy.ch/joomlatools-files/docman-files/Send>

[ing%20Up%20a%20Flare%20Autonomous%20Weapons%20Systems%20Proliferation%20Risks.pdf](#)

Moses, J., & Ford, G. (2024). Encoding the enemy: The politics within and around ethical algorithmic war. *Global Society*, 38(1), 83-99.

Nadibaidze, A. (2024, July 15). Visuals of AI in the military domain: Beyond 'killer robots' and towards better images? *Better Images of AI Blog*. <https://blog.betterimagesofai.org/visuals-of-ai-in-the-military-domain-beyond-killer-robots-and-towards-better-images/>

Payne, K. (2021). *I, warbot: The dawn of artificially intelligent conflict*. Oxford University Press.

Romele, A. (2022). Images of artificial intelligence: A blind spot in AI ethics. *Philosophy & Technology*, 35(1), 4.

Rosert, E., & Sauer, F. (2020). How (not) to stop the killer robots: A comparative analysis of humanitarian disarmament campaign strategies. *Contemporary Security Policy*, 42(1), 4-29.

Scharre, P. (2018). *Army of None: Autonomous Weapons and the Future of War* (Vol. 52). WW Norton & Company.

Scharre, P. (2021). Debunking the AI arms race theory. *Texas National Security Review*, 4(3), 122-132.

Seixas-Nunes, A. (2022). *The Legality and Accountability of Autonomous Weapon Systems: A Humanitarian Law Perspective*. Cambridge University Press.

Sharkey, N. (2011). The automation and proliferation of military drones and the protection of civilians. *Law, Innovation and Technology*, 3(2), 229-240.

Wagner, W., Viidalepp, A., Idoiaga-Mondragon, N., Talves, K., Lillemäe, E., Pekarev, J., & Otsus, M. (2023). Lay representations of artificial intelligence and autonomous military machines. *Public Understanding of Science*, 32(7), 926-943.

Watling, J. (2023). *The Arms of the Future: Technology and Close Combat in the Twenty-first Century*. Bloomsbury Publishing.

Young, K. L., & Carpenter, C. (2018). Does science fiction affect political fact? Yes and no: A survey experiment on "killer robots". *International Studies Quarterly*, 62(3), 562-576.