Human Rights and Lethal Autonomous Weapons Systems

Australian Human Rights Commission

Submission to the Human Rights Council Advisory Committee

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# Introduction

1. The Australian Human Rights Commission (Commission) welcomes the opportunity to make this submission to the Human Rights Council Advisory Committee (Committee) in response to its [Call for Input](https://www.ohchr.org/en/calls-for-input/2023/call-inputs-study-human-rights-council-advisory-committee-human-rights).
2. The role of the Commission is to work towards a world in which human rights are respected, protected and promoted. The Commission has expertise on the intersection between technology and human rights.
3. The Commission has demonstrated this expertise across several United Nations (UN) level submissions in 2023, including:

* [Human Rights in the Digital Age:](https://humanrights.gov.au/our-work/legal/submission/human-rights-digital-age) Global Digital Compact submission to the UN Office of the Secretary-General's Envoy on Technology.
* [Tackling Technology-facilitated Slavery:](https://humanrights.gov.au/our-work/legal/submission/tackling-technology-facilitated-slavery) UN Special Rapporteur on Slavery submission on the use of technology in facilitating and preventing slavery.
* [Global AI Governance:](https://humanrights.gov.au/our-work/legal/submission/centring-human-rights-ai-global-governance) UN High-Level Advisory Body on AI submission on global AI governance.

1. In this submission the Commission addresses several questions posed by the Call for Input. The Commission welcomes further opportunities to engage with the Committee.

# Definition of LAWS

1. There is no concrete definition of Lethal Autonomous Weapons Systems (LAWS). However, for the purpose of this submission LAWS can be understood as weapons that independently select and attack targets.[[1]](#endnote-2) LAWS include unmanned aerial vehicles, unmanned surface vessels, unmanned underwater vessels and unmanned ground vehicles (amongst others).[[2]](#endnote-3)

# Question 1

1. Although international human rights law may have application to new and emerging technologies in the military domain (NTMD), such as LAWS, there are currently no targeted international laws which adequately capture and address the use of LAWS in conflict. There are also concerns that LAWS may not be capable of meeting the requirements of international human rights or humanitarian law.[[3]](#endnote-4)

## Proportionality

1. One of the core principles of international humanitarian law is the principle of proportionality.[[4]](#endnote-5) This principle prohibits attacks which are 'expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated'.[[5]](#endnote-6) An attack will be proportionate if the perceived advantages outweigh the harms.[[6]](#endnote-7)
2. LAWS rely upon artificial intelligence (AI) and facial recognition technologies (FRT) to independently identify and conduct attacks. Currently, AI cannot be programmed to comprehend and evaluate the infinite number of possibilities that can unfold in a conflict zone, meaning that they are not able to accurately decide proportionality and abort a planned attack if required.[[7]](#endnote-8) AI is also unable to understand the intrinsic value of human life, thus making it unable to undertake any weighing exercise in relation to proportionality.
3. If proportionality in warfare is not adhered to, then neither are the human rights of civilians. United Nations Secretary-General António Guterres has previously declared that machines determining proportionality in life or death situations is ‘politically unacceptable and morally repugnant’.[[8]](#endnote-9)

## LAWS

1. The Group of Governmental Experts of the Convention on Conventional Weapons is one of the key inter-governmental groups which seeks to regulate autonomous weapons. 126 States are parties to the Convention, including the five permanent members of the United Nations Security Council.[[9]](#endnote-10) In 2019, the group adopted 11 guiding principles[[10]](#endnote-11) on the use of LAWS which confirmed the following:

* International humanitarian law continues to apply fully to all weapons systems.
* Accountability cannot be transferred to machines and therefore human responsibility is retained.
* Human-machine interaction should ensure that the use of LAWS complies with international humanitarian law.
* Accountability for developing, deploying and using any emerging weapons systems in the framework of the Convention on Certain Conventional Weapons (CCW) must be ensured in accordance with international humanitarian law.
* When interacting with LAWS, States must consider whether such actions are prohibited by international law.
* The risk of acquisition of LAWS by terrorist groups and the risk of proliferation should be relevant concerns.
* Risk assessments and mitigation measures must be part of interactions with LAWS.
* Consideration should be given to the use of emerging technologies in the area of LAWS in upholding compliance with international obligations.
* Emerging technologies should not be anthropomorphised in crafting potential policy measures.
* Discussions and policy measures within the context of the CCW should not hamper progress in or access to peaceful uses of intelligent autonomous technologies.
* The CCW offers an appropriate framework for dealing with the issue of LAWS.[[11]](#endnote-12)

1. However, as these principles are not currently enforceable, their usefulness is limited. The Group of Governmental Experts has so far failed to reach any agreement beyond the guiding principles, highlighting the difficulty with reaching an agreement to govern LAWS. Its impact is also curtailed by several key States not being party to the CCW.[[12]](#endnote-13)

## Use of LAWS

1. The use of LAWS directly conflicts with the right to life under international human rights law. As the Human Rights Committee noted in General Comment No. 36 (2019) this right is ’the supreme right from which no derogation is permitted, even in situations of armed conflict or other public emergencies that threaten the life of the nation’.[[13]](#endnote-14)
2. Due (in part) to a lack of regulation, countries are still using LAWS to deprive individuals of their right to life. Some of the most extensively documented use of LAWS in active conflict zones has been in the Libyan civil war and the Russia-Ukraine War.[[14]](#endnote-15)
3. There is evidence of Russian forces using POM-3 ‘Medallion’ anti-personnel mines in conflict.[[15]](#endnote-16) This mine has a seismic sensor to enable it to detect movement in a radius of 16 meters and detonate.[[16]](#endnote-17) Despite international efforts to ban land mines, Russia has now successfully autonomised them, proving that regulation of these weapons is of the utmost importance.
4. In Libya, LAWS were used as drones to strike targets without the need for connection between the operator and the munition, in what is described as a ’fire, forget and find’ method. The targets of this reported attack were the retreating soldiers of the Libyan National Army of Khalifa Haftar.[[17]](#endnote-18)
5. There is a clear need to specifically regulate LAWS as a matter of urgency, as it will only become increasingly difficult to do so if LAWS become more widely available without restrictions being in place.

# Question 2

1. The measures that can be taken to foster international cooperation and dialogue in order to promote the effective regulation of LAWS include both action by the UN and strengthened investigatory and reporting measures on NTMD (amongst others not discussed in this submission).

## UN action

1. In 2023, the UN Secretary-General’s New Agenda for Peace called for the prohibition of LAWS, recommending that States develop a legally binding instrument that bans LAWS, especially those that do not require human control and are non-compliant with international humanitarian law.[[18]](#endnote-19)
2. The UN Secretary-General, António Guterres, and the President of the International Committee of the Red Cross, Mirjana Spoljaric, have also made a joint appeal for States to ’urgently establish new international rules on autonomous weapons systems, to protect humanity’.[[19]](#endnote-20)
3. Since then, the First Committee of the UN General Assembly adopted its first ever resolution on autonomous weapons on 01 November 2023.[[20]](#endnote-21) The resolution stressed the ’urgent need for the international community to address the challenges and concerns raised by autonomous weapons systems’.[[21]](#endnote-22)
4. This action recognises the concerns of the international community, and takes the initial step towards encouraging global cooperation and negotiations to regulate LAWS.
5. Promisingly, an item titled ‘lethal autonomous weapons systems’ has been included in the provisional agenda for the next session of the General Assembly, indicating that there will be further action.[[22]](#endnote-23)
6. However progress is slow as in late November CCW attempts to negotiate regulation on LAWS stalled.[[23]](#endnote-24) It has been over a decade since LAWS were notably raised by the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns.[[24]](#endnote-25) In this 2013 report to the Human Rights Council, Heyns called for States to establish national moratoria on ‘lethal autonomous robotics’ (the language has since changed to LAWS).[[25]](#endnote-26) More must be done to regulate LAWS with much needed urgency.

## Independent reviews

1. Article 36 of Protocol I to the Geneva Conventions provides that States have an obligation to carry out legal reviews of new weapons to ensure that armed forces conduct hostilities in accordance with international law. Although Article 36 puts the obligation of monitoring on States, there are no powers holding them to account in complying with their Article 36 responsibility.
2. This process is also an internal one, predicated on good faith reviews as States are also not obliged to disclose the outcome of these reviews.[[26]](#endnote-27)
3. Given the growing use of LAWS in conflict zones (at the time of writing), and mounting pressure from the global community to regulate and prohibit LAWS the review function must be strengthened.
4. States may not see it as being in their interests to review the development and deployment of new weapons – especially if they are simultaneously engaged in conflict. As such, there needs to be strengthened investigatory and reporting measures applying to NTMD. The introduction of a new special procedure to advise the Human Rights Council on NTMD would improve transparency.

**Recommendation 1: The Special Rapporteur on New and Emerging Military Technologies in the Military Domain be established.**

1. LAWS are increasingly being raised by other Special Rapporteurs who may not always have the focused mandate to consider them in detail. For example, the Special Rapporteur on counter-terrorism and human rights, Fionnuala Ní Aoláin, called for the global prohibition of LAWS in a 2023 report to the Human Rights Council on the use of new technologies.[[27]](#endnote-28) Christof Heyns has also considered LAWS across several reports.[[28]](#endnote-29)
2. A clear advantage of the proposed Special Rapporteur on New and Emerging Military Technologies in the Military Domain would be the ability to bring a specific focus on LAWS. The Commission recommends that the Special Rapporteur begin their mandate by investigating the development and use of LAWS.
3. Given the significant impact LAWS have on human rights, the proposed special procedures mandate-holder could immediately draw much needed attention to the use of LAWS. Their ability to examine, advise and publicly report on human rights challenges is fundamental in ensuring transparency in the development and use of LAWS.

## Universality and inalienability

**Recommendation 2: The importance of universality and inalienability of human rights be central in all discussions of NTMD.**

1. Universality of human rights is the cornerstone of international human rights law – they are not granted by any State and are inherent to all, regardless of their personal characteristics or circumstances. Introduced in the Universal Declaration of Human Rights (UDHR) in 1948, it has since been recognised across human rights conventions, declarations and resolutions.[[29]](#endnote-30)
2. Human rights cannot be limited, except in specific situations and according to due process.[[30]](#endnote-31) Except for those listed under Article 4(2),[[31]](#endnote-32) some rights under the International Covenant on Civil and Political Rights (ICCPR) can be temporarily suspended or limited in exceptional circumstances threatening 'the life of the nation’. If States consider invoking Article 4 in a situation of armed conflict, International Humanitarian Law assists in ensuring that derogation powers are not misused and only exercised with concomitant justification as to why such derogation was legitimate and necessary.[[32]](#endnote-33)
3. These two principles must remain at the forefront of all discussions of NTMD and their regulation.

# Question 4

1. NTMD present a range of human rights challenges. Of particular concern is the impact of algorithms being used to make critical decisions.

## ‘Human in the loop’

1. A key feature of AI is that it can undertake tasks with little-to-no active human control – once given instructions. Without continuous human oversight, there is an increased likelihood for digital dehumanisation and discrimination.
2. In 2022, the Group of Government Experts on LAWS released a report on the challenges in the military and civil sphere posed by AI. One of the noted issues was the occurrence of digital dehumanisation and discrimination based on gender and race.[[33]](#endnote-34) This often occurs due to algorithmic bias.
3. Algorithmic bias arises where an AI produces outputs that result in unfairness or discrimination.[[34]](#endnote-35) When used in civilian contexts there are risks of unlawful discrimination.[[35]](#endnote-36) However, as AI is increasingly interoperable with NTMD, the impact of algorithmic bias in the context of LAWS can be a matter of life and death.
4. FRT utilises AI and pattern recognition. However, FRT is highly problematic and often unreliable. Several products have already been found to perform better for those with light-skinned and masculine appearances, while failing to recognise feminine appearances, people of colour or people with disability.[[36]](#endnote-37) This may result in people being incorrectly targeted.
5. Relying on algorithms to distinguish between combatants and civilians is ethically problematic and has potentially dangerous consequences for the civilian population. To reduce such likelihoods, it is essential that while designing a program or system that acts autonomously, there are open conversations about what type of bias may occur.
6. Additionally, NTMD which utilise AI must ensure that informed human decision makers remain ‘in the loop’ to evaluate all decisions and outcomes.
7. Where NTMD are not capable of functioning with a ‘human in the loop’, or for practical reasons a lethal military technology is designed to be free of human interaction or oversight, it should be prohibited by international law. This would require NTMD such as LAWS being banned.
8. Whilst there has not yet been consensus for the creation of a new binding instrument on the international stage, many States agree that a certain level of human control and oversight is required for autonomous weapons.[[37]](#endnote-38)

**Recommendation 3: Humans must remain as active overseers of all NTMD which make critical decisions that may result in harm to people.**

**Recommendation 4: Any NTMD, such as LAWS, which operate free of human oversight, or engagement, should be prohibited by international law.**

# Question 17

1. On 07 June 2023, Human Rights Commissioner, Lorraine Finlay, participated in RightsCon Costa Rica. Commissioner Finlay delivered the speech [‘Stopping Killer Robots – Prohibiting the use of Lethal Autonomous Weapon Systems’](https://humanrights.gov.au/about/news/speeches/stopping-killer-robots).
2. The speech called for the urgent regulation of LAWS to limit their misuse. The speech summarised the key issues around LAWS, including technical inaccuracies of FRT and its possible implications in rising domestic terrorism and broader arms races. The Commission continues to advocate for LAWS regulation.
3. The Commission has also examined the use of neurotechnologies in military spheres as part of its upcoming Background Report on Neurotechnology and Human Rights.
4. Finally, the Commission has co-led the drafting of an additional submission to this Committee by the NHRI Digital Rights Alliance, alongside the Danish Institute for Human Rights.

# Question 27

1. Current international law and government policies have not been effective in addressing the challenges of LAWS. There need to be more concentrated efforts focused on establishing a legal framework to protect human rights from the use of LAWS.
2. In establishing a legal framework, stakeholders must decide whether autonomous systems in general should be banned, or just ones that are considered ‘lethal’ – using confirmed definitions of AI, LAWS and autonomous decision systems. The lack of clarity surrounding this issue has hampered past discussions.
3. In this necessary action to establish regulation on LAWS, a prohibition on the technology (where it is incompatible with international human rights law) is needed to ensure compliance with pre-existing international obligations.

**Recommendation 5: LAWS must be regulated, and where the technology is incompatible with international human rights law – it should be prohibited.**

# Recommendations

1. The Commission makes the following recommendations.

**Recommendation 1**

The Special Rapporteur on New and Emerging Military Technologies in the Military Domain be established.

**Recommendation 2**

The importance of universality and inalienability of human rights be central in all discussions of NTMD.

**Recommendation 3**

Humans must remain as active overseers of all NTMD which make critical decisions that may result in harm to people.

**Recommendation 4**

Any NTMD, such as LAWS, which operate free of human oversight, or engagement, should be prohibited by international law.

**Recommendation 5**

LAWS must be regulated, and where the technology is incompatible with international human rights law – it should be prohibited.

**Endnotes**

1. International Committee of the Red Cross, ‘*Autonomous Weapons Systems: Technical, Military, Legal and Humanitarian Aspects*’ (Expert Meeting, 2014) 7.  [↑](#endnote-ref-2)
2. Michael Klare, *‘Assessing the Dangers: Emerging Military technologies and Nuclear (In)Stablity, An Arms Control Association Report*’, (Report, February 2023) 12. [↑](#endnote-ref-3)
3. Christof Heyns, ‘*Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions’* (Report to the Human Rights Council, 09 April 2013) 6 [31]. [↑](#endnote-ref-4)
4. Neil Davison, ‘*A Legal Perspective: Autonomous Weapon Systems under International Humanitarian Law’* (UNODA Occasional Papers, No. 30, 2018) 7-8. [↑](#endnote-ref-5)
5. ICRC Online Casebook, ‘*Proportionality*’ (Webpage) <<https://casebook.icrc.org/a_to_z/glossary/proportionality>>. [↑](#endnote-ref-6)
6. Human Rights Watch, ‘*Losing Humanity: The Case against Killer Robots’* (Report, 2012) 25. [↑](#endnote-ref-7)
7. Human Rights Watch, ‘*Losing Humanity: The Case against Killer Robots’* (Report, 2012) 35. [↑](#endnote-ref-8)
8. United Nations, ‘*Machines Capable of Taking Lives without Human Involvement Are Unacceptable, Secretary-General Tells Experts on Autonomous Weapons Systems’* (Press Release, United Nations, 25 March 2019) <<https://press.un.org/en/2019/sgsm19512.doc.htm>>. [↑](#endnote-ref-9)
9. United Nations Office for Disarmament Affairs, ‘*High Contracting Parties and Signatories CCW’* (Webpage) <<https://www.un.org/disarmament/the-convention-on-certain-conventional-weapons/high-contracting-parties-and-signatories-ccw/>>. [↑](#endnote-ref-10)
10. United Nations Office for Disarmament Affairs, ‘*Lethal Autonomous Weapon Systems (LAWS)*’ <<https://disarmament.unoda.org/the-convention-on-certain-conventional-weapons/background-on-laws-in-the-ccw/>>. [↑](#endnote-ref-11)
11. Annex III, *Convention on Certain Conventional Weapons*, opened for signature 10 October 1980, 1342 UNTS 137 (entered into force 2 December 1983). [↑](#endnote-ref-12)
12. United Nations Office for Disarmament Affairs, ‘*High Contracting Parties and Signatories CCW’* (Webpage) <<https://www.un.org/disarmament/the-convention-on-certain-conventional-weapons/high-contracting-parties-and-signatories-ccw/>>. [↑](#endnote-ref-13)
13. Fionnuala Ní Aoláin, ‘*Human Rights Implications of the Development, Use and Transfer of New Technologies in the Context of Counter-terrorism and Countering and Preventing Violent Extremism’* (Report of the Special Rapporteur on the Promotion and Protection of Human Rights and Fundamental Freedoms while Countering Terrorism, 01 March 2023) 10 [30]. [↑](#endnote-ref-14)
14. Maria Cramer, ‘A.I Drone May have Acted on its Own in Attacking Fighters, U.N Says’, *New York Times* (Online, 03 June 2021) <<https://www.nytimes.com/2021/06/03/world/africa/libya-drone.html>>; Robert Trager, ‘Killer Robots are Here - and we Need to Regulate Them’, *Foreign Policy* (Online, 11 May 2022) <<https://foreignpolicy.com/2022/05/11/killer-robots-lethal-autonomous-weapons-systems-ukraine-libya-regulation/>>. [↑](#endnote-ref-15)
15. Human Rights Watch, ‘Ukraine: Russia Uses Banned Antipersonnel Landmines’ (Report, 29 March 2022) <<https://www.hrw.org/news/2022/03/29/ukraine-russia-uses-banned-antipersonnel-landmines>>. [↑](#endnote-ref-16)
16. Human Rights Watch, ‘Ukraine: Russia Uses Banned Antipersonnel Landmines’ (Report, 29 March 2022) <<https://www.hrw.org/news/2022/03/29/ukraine-russia-uses-banned-antipersonnel-landmines>>. [↑](#endnote-ref-17)
17. Panel of Experts on Libya, ‘*Letter Dated 8 March 2021 from the Panel of Experts on Libya Established Pursuant to Resolution 1973 (2011) Addressed to the President of the Security Council*’ (Report S/2021/229, 08 March 2021) 17; see also James Vincent, ‘Have Autonomous Robots Started Killing in War?’, *The Verge* (Online, 03 June 2021) ><https://www.theverge.com/2021/6/3/22462840/killer-robot-autonomous-drone-attack-libya-un-report-context>>. [↑](#endnote-ref-18)
18. United Nations Office for Disarmament Affairs, ‘*Lethal Autonomous Weapon Systems (LAWS)*’ <<https://disarmament.unoda.org/the-convention-on-certain-conventional-weapons/background-on-laws-in-the-ccw/>>. [↑](#endnote-ref-19)
19. International Committee of the Red Cross, ‘*Joint Call by the United Nations Secretary-General and the President of the International Committee of the Red Cross for States to Establish New Prohibitions and Restrictions on Autonomous Weapon Systems*’ (News Release, 05 October 2023) <<https://www.icrc.org/en/document/joint-call-un-and-icrc-establish-prohibitions-and-restrictions-autonomous-weapons-systems>>. [↑](#endnote-ref-20)
20. United Nations’ General Assembly, ‘*Lethal Autonomous Weapons Systems*’ (Resolution L.56, 12 October 2023). [↑](#endnote-ref-21)
21. See generally United Nations’ General Assembly, ‘*Lethal Autonomous Weapons Systems*’ (Resolution L.56, 12 October 2023) 2. [↑](#endnote-ref-22)
22. United Nations’ General Assembly, ‘*Lethal Autonomous Weapons Systems*’ (Resolution L.56, 12 October 2023) 2. [↑](#endnote-ref-23)
23. Stop Killer Robots, ‘2023 CCW falls short of the UN Secretary-General and ICRC calls for a legal instrument by 2026’ (Webpage) <<https://www.stopkillerrobots.org/news/2023-ccw-falls-short-of-the-un-secretary-general-and-icrc-calls-for-a-legal-instrument-by-2026/>>. [↑](#endnote-ref-24)
24. See generally Christof Heyns, ‘*Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions*’ (Report A/HRC/23/47, 09 April 2013). [↑](#endnote-ref-25)
25. Christof Heyns, ‘*Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions*’ (Report A/HRC/23/47, 09 April 2013) 21-22. [↑](#endnote-ref-26)
26. Christof Heyns, ‘*Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions*’ (Report A/HRC/23/47, 09 April 2013) 20 [107]. [↑](#endnote-ref-27)
27. Fionnuala Ní Aoláin, ‘*Human Rights Implications of the Development, Use and Transfer of New Technologies in the Context of Counter-terrorism and Countering and Preventing Violent Extremism*’ (Report A/HRC/23/47, 09 April 2013) 10 [29]. [↑](#endnote-ref-28)
28. Christof Heyns, ‘*Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions*’ (Report A/HRC/23/47, 09 April 2013); See also A/71/372; A/HRC/29/37. [↑](#endnote-ref-29)
29. United Nations, ‘*What are Human Rights?*’ (Webpage) <<https://www.ohchr.org/en/what-are-human-rights>>. [↑](#endnote-ref-30)
30. United Nations, ‘*What are Human Rights?*’ (Webpage) <<https://www.ohchr.org/en/what-are-human-rights>>. [↑](#endnote-ref-31)
31. International Convention on Civil and Political Rights, opened for signature 16 December 1966, 999 UNTS 171 (entered into force 23 March 1976) (ICCPR) Art 4(1), 4(2). [↑](#endnote-ref-32)
32. Human Rights Committee, General Comment No 29: States of Emergency (Article 4), 1950th meeting, Un Doc CCPR/C/21/Rev.1/Add.11 (31 August 2001) 2[3]. [↑](#endnote-ref-33)
33. Automated Decision Research, ‘*Artificial Intelligence and Automated Decisions: Shared Challenges in the Civil and Military Spheres*’ (Report, September 2022) 6. [↑](#endnote-ref-34)
34. Australian Human Rights Commission, ‘*Final Report*’ (Report, 2021) 13. [↑](#endnote-ref-35)
35. Australian Human Rights Commission, ‘*Final Report*’ (Report, 2021) 13. [↑](#endnote-ref-36)
36. See e.g. Joy Buolamwini and Timinit Guru, ‘Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification’ (2018) 81 *Proceedings of Machine Learning Research* 1; KS Krishnapriya, Kushal Vangara, Michael C King, Vitor Albiero and Kevin Bowyer, ‘Characterizing the Variability in Face Recognition Accuracy Relative to Race’ (Conference Paper, IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops, 2019); Inioluwa Deborah Raji and Joy Buolamwini, ‘Actionable Auditing: Investigating the Impact of Publicly Naming Biased Performance Results of Commercial AI Products’ (Conference on Artificial Intelligence, Ethics, and Society, 2019). [↑](#endnote-ref-37)
37. Quang Pham, et al., ‘Lethal Autonomous Weapon Systems. [Ethical, Legal, and Societal Issues]’  (2018) 25(1) *IEEE Robotics & Automation Magazine* 123-126. [↑](#endnote-ref-38)