

# War Crimes Involving Autonomous Weapons

Responsibility, Liability and Accountability

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## Abstract

*This article identifies and evaluates key international legal aspects concerning three notions that have figured in debates on war crimes involving an autonomous weapon system (AWS): responsibility, liability and accountability. It focuses on the general contours of the existing international law of armed conflict, also known as international humanitarian law (IHL), and related fields, concepts and institutions. Regarding responsibility, this article examines, on one hand, the international responsibility of a state for an internationally wrongful act related to a breach of a rule of IHL involving an AWS that may form the basis of a war crime and, on the other hand, individual criminal responsibility for a war crime involving an AWS. As for liability, this article outlines three international legal concepts of state liability potentially related to a war crime involving an AWS. Finally, this article sets out an, at least, legally adjacent concept of accountability that involves an explanation of the conduct related to a war crime involving an AWS and imposing political, legal, social or other consequences where such an explanation is absent or insufficient.*

## 1. Introduction

At least since the early 2010s, actual and imputed prospects for the use in armed conflict of autonomous weapons have helped to catalyse growing interest in, and concern regarding, these weapons at the international level. On one end of the spectrum, the focus has been placed on increasingly extensive or more complex forms of autonomy *in* (aspects of) existing and emerging weapon systems. On the other end, so-called ‘fully’ autonomous weapons have formed

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the basis of scrutiny. In intergovernmental and academic debates, the (un)lawfulness of the development or use of an autonomous weapon system (AWS) has often been inextricably linked conceptually to whether at least one person or entity can, in theory and practice, be held to account for the behaviours and effects of the weapon system. That framing, in turn, has raised several questions. Those inquiries include the questioning of what it means to hold a natural person or an entity responsible — or, perhaps, liable or (otherwise) accountable — for the actions and omissions related to an employment of an AWS or the effects arising in relation to such an employment. The stakes of that question rise even higher when an AWS is involved in a ‘serious’ violation of international humanitarian law (IHL) characterized as a war crime.<sup>1</sup>

Many of the legal concerns around the production, acquisition, employment or transfer of an AWS appear to be rooted partly in two (potentially interrelated) issues. The first relates to the (un)lawfulness under international law of the development and use of an AWS. The second concerns the ascription and application of legal responsibility or liability (or both) to parties to an armed conflict or natural persons (or some combination of such actors) for unlawful conduct or unlawful harm arising in connection with an employment of an AWS in armed conflict. A lack of an internationally agreed definition of autonomous weapons,<sup>2</sup> at least to date, contributes to difficulties in comprehensively addressing those issues. Nevertheless, one can discern three general positions among those states that have set out an opinion regarding these legal issues. One view sees the use of autonomous weapons, or at least certain autonomous functions in weapons, as lawful and as entailing the potential for certain purported ‘humanitarian benefits’.<sup>3</sup> Under a second position, the use of autonomous weapons, or at least certain autonomous functions in weapon systems, is considered unlawful.<sup>4</sup> And a third set of views conceives of the

- 1 Decision on the Defence Motion for Interlocutory Appeal on Jurisdiction, *Tadić* (IT-94–1-AR72), Appeals Chamber, 2 October 1995, § 94.
- 2 See e.g. M. Taddeo and A. Blanchard, ‘A Comparative Analysis of the Definitions of Autonomous Weapons Systems’, 28 *Science and Engineering Ethics* (2022) 37.
- 3 See e.g. Russian Federation, *National Implementation of the Guiding Principles on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems – Working Paper* (Unofficial Translation) (2020), available online at <https://perma.cc/Z67Q-5J5N> (visited 17 July 2023); United States, *Humanitarian Benefits of Emerging Technologies in the Area of Lethal Autonomous Weapon Systems*, Group of Governmental Experts of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects (2018) CCW/GGE.1/2018/WP.4, available online at [https://docs-library.unoda.org/Convention\\_on\\_Certain\\_Conventional\\_Weapons\\_-\\_Group\\_of\\_Governmental\\_Experts\\_\(2018\)/CCW\\_GGE.1\\_2018\\_WP.4.pdf](https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Group_of_Governmental_Experts_(2018)/CCW_GGE.1_2018_WP.4.pdf) (visited 17 July 2023).
- 4 For a collection of states’ views, see ‘A Compilation of Materials Apparently Reflective of States’ Views on International Legal Issues Pertaining to the Use of Algorithmic and Data-Reliant Socio-Technical Systems in Armed Conflict’, Harvard Law School Program on International Law and Armed Conflict, (2020), available online at <https://pilac.law.harvard.edu/a-compilation-of-materials-apparently-reflective-of-states-views-on-international-legal-issues-pertaining-to-the-use-of-algorithmic-and-data-reliant-socio-technical-systems-in-armed-conflict> (visited 29 September 2022).

use of some autonomous weapons and some autonomous functions in weapon systems as lawful and the use of certain others as unlawful.

Meanwhile, in the vast majority of today's numerous armed conflicts,<sup>5</sup> it appears that many, perhaps most, war crimes go un-investigated or, at the very least, unpunished — not least those war crimes related to violations of the principles and rules regulating the conduct of hostilities.<sup>6</sup> Currently, there are few reasons to think that war crimes involving an AWS will necessarily face greater practical prospects for accountability.<sup>7</sup> That is partly because most states do not appear, at least from publicly available sources, to have the requisite technical means and knowledge to identify potentially relevant conduct satisfactorily, let alone to institute proceedings effectively for war crimes involving an AWS.

Despite, or perhaps because of, this unsatisfactory contemporary reality, it is worth exploring the current situation related to responsibility for war crimes generally and those involving an AWS specifically. As part of such an exploration, this article seeks to identify and evaluate certain key aspects of three international legal — or, at least, legally adjacent — concepts or institutions that have figured, to varying degrees, in contemporary intergovernmental, scholarly and policy debates on autonomous weapons. Those three notions are responsibility, liability and accountability. A premise underlying this article's analysis is that there is normative, operational and explanatory value in identifying and distinguishing various forms of responsibility, liability and accountability related to war crimes involving an AWS. A starting point is to recognize that with respect to the field of IHL there is no single, comprehensive definition of 'responsibility', 'liability' or 'accountability'. This article therefore attempts to assist in situating relevant debates on war crimes involving an AWS by exploring and distinguishing existing international legal concepts and institutions as they may relate to these notions. Through this inquiry, this article seeks to illustrate aspects of the current legal situation; to underline issues that arguably merit more extensive attention and, perhaps, even legal development or reform; and to evaluate — and, thereby, strengthen — international law's capacity to provide meaningful protection in wars that might involve autonomous weapons.

- 5 See e.g. International Committee of the Red Cross, *Annual Report 2020: Facts and Figures*, (2020), available online at [https://library.icrc.org/library/docs/DOC/WEB\\_020.pdf](https://library.icrc.org/library/docs/DOC/WEB_020.pdf) (visited 17 July 2023), at 4: stating that 'over 100 armed conflicts were being fought around the world in 2020.'
- 6 See e.g. P. Gaeta, 'Serious Violations of the Law on the Conduct of Hostilities: A Neglected Class of War Crimes?' in F. Pocar, M. Pedrazzi, and M. Frulli (eds), *War Crimes and the Conduct of Hostilities* (Edward Elgar Publishing Limited, 2013) 20–37.
- 7 But, see, M. Bo, L. Bruun and V. Boulanin, 'Retaining Human Responsibility in the Development and Use of Autonomous Weapon Systems - On Accountability for Violations of International Humanitarian Law Involving AWS', (Stockholm International Peace Research Institute, 2022) (noting possibilities for, e.g., tracing and auditing the technical means underlying an AWS); V. Boulanin and M. Bo, 'Three Lessons on the Regulation of Autonomous Weapons Systems to Ensure Accountability for Violations of IHL', *Humanitarian Law and Policy Blog*, 2 March 2023, available online at <https://blogs.icrc.org/law-and-policy/2023/03/02/three-lessons-autonomous-weapons-systems-ihl/> (visited 3 April 2023).

## 2. International Responsibility Concerning War Crimes

A notion of international responsibility arguably has a strong basis in international law, particularly as it relates to the international responsibility of a state for a wrongful act<sup>8</sup> or to individual criminal responsibility for an international crime.<sup>9</sup> This part will therefore address issues of international responsibility related to war crimes involving an AWS with respect to states and individuals in turn.

International organizations and certain other actors involved in an armed conflict may also be responsible under international law in relation to the commission of war crimes involving an AWS. This article, however, will not specifically address the question of their responsibility for the following reasons. Regarding international organizations, there is relatively sparse practice concerning the rules governing their international responsibility in this area and there exists contestation as to whether all relevant aspects of the International Law Commission's 'Draft Articles on the Responsibility of International Organizations'<sup>10</sup> are reflective of customary international law. Nevertheless, the same issues that arise with respect to state responsibility concerning war crimes involving an AWS may arise, *mutatis mutandis* at least theoretically, with respect to international organizations. As for other actors, some governments have expressed concerns that certain entities other than states, such as non-state armed groups, might develop, acquire, employ or transfer an AWS.<sup>11</sup> Yet, in international law as it currently stands, there appears to be no generally recognized institution of responsibility of a non-state organized armed group that is a party to an armed conflict.<sup>12</sup> In addition, there is no generally recognized institution of responsibility in contemporary international law entailing the responsibility of other actors, such as private commercial entities, whose conduct may pertain to war crimes involving an AWS.<sup>13</sup> However, the

8 International Law Commission, 'Draft Articles on Responsibility of States for Internationally Wrongful Acts, with Commentaries, 2001', *Yearbook of the International Law Commission* 2001, vol II, Pt 2 (United Nations Publication 2007) (hereafter 'DARSIWA').

9 Among many others, see E. van Sliedregt, *Individual Criminal Responsibility in International Law* (OUP, 2012).

10 International Law Commission, 'Draft Articles on the Responsibility of International Organizations, with Commentaries, 2011', *Yearbook of the International Law Commission* 2011, vol II, Pt 2 (United Nations Publication, 2018).

11 See e.g. Meeting of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, 'Final Report', CCW, CCW/MSP/2019/9, 13 December 2019, at 10: 'When developing or acquiring new weapons systems based on emerging technologies in the area of lethal autonomous weapons systems, physical security, appropriate non-physical safeguards (including cyber-security against hacking or data spoofing), the risk of acquisition by terrorist groups and the risk of proliferation should be considered' (emphasis added).

12 But, see, L.I. Alvarez, *Towards a Regime of Responsibility of Armed Groups in International Law* (Intersentia, 2020).

13 On prospects related to corporate responsibility under international law, with a focus on such legal entities developing autonomous weapons, see D. Mauri, *Autonomous Weapons Systems and*

international responsibility of a state may arise, under certain conditions, with respect to cases in which one or more private persons over whom the state exercises authority conducted an attack involving an AWS that constitutes a war crime.<sup>14</sup>

### A. State Responsibility Concerning War Crimes Involving an AWS

It is not trivial to recall that the international responsibility of states is a form of collective responsibility. The basic notion is that an internationally wrongful act exists when conduct, whether an action or an omission, that is attributable to a state constitutes a breach of an international obligation owed by that state. Provided that a circumstance does not preclude the wrongfulness of that breach, certain consequences flow as a matter of law from the commission of the internationally wrongful act. Those consequences are the obligations of cessation, non-repetition and reparation.<sup>15</sup> These basic principles are also applicable with respect to the international responsibility of states for breaches of IHL. For instance, the four Geneva Conventions of 1949 lay down expressly that no state party shall be allowed to absolve itself or any other state party to one of those instruments of any responsibility incurred by itself or by another state party in respect of grave breaches,<sup>16</sup> all of

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*the Protection of the Human Person: An International Law Analysis* (Edward Elgar Publishing, 2022), at 199–211.

- 14 For example, where one or more private persons over whom the state exercises authority — even if their conduct is not (also) attributable to the state — engaged in an attack involving an AWS that constitutes a war crime, the state is arguably responsible for the failure to perform its general duty of due diligence to prevent and repress the breach. See International Committee of the Red Cross, *infra* note 16, para. 150.
- 15 Art. 26 DARSIVA: Nothing in the relevant chapter of DARSIVA precludes the wrongfulness of any act of a state which is not in conformity with an obligation arising from a peremptory norm of general international law. See *infra* note 19 regarding the potential relevance concerning war crimes.
- 16 Art. 51 Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field (1949), available online at <https://treaties.un.org/pages/showDetails.aspx?objid=080000028015847c> (visited 17 July 2023) (hereafter ‘GC I’); Art. 52 Geneva Convention for the Amelioration of the Condition of the Wounded, Sick and Shipwrecked Members of the Armed Forces at Sea (1949), available online at <https://treaties.un.org/pages/showDetails.aspx?objid=08000002801591b0> (visited 17 July 2023) (hereafter ‘GC II’); Art. 131 Geneva Convention Relative to the Treatment of Prisoners of War (1949), available online at <https://treaties.un.org/pages/showDetails.aspx?objid=0800000280159839> (visited 17 July 2023) (hereafter ‘GC III’); Art. 148 Geneva Convention Relative to the Protection of Civilian Persons in Time of War (1949), available online at <https://treaties.un.org/pages/showDetails.aspx?objid=0800000280158b1a> (visited 17 July 2023) (hereafter ‘GC IV’). In those provisions, ‘any liability’ is used in the English text of these provisions while ‘*des responsabilités*’ is used in the equally authentic French text. A state responsible for a violation of IHL — including a violation that forms the basis of a grave breach involving an AWS committed by a member of the state’s armed forces or a person (otherwise) acting under the state’s authority or command — is required to make full reparation for the loss or injury caused by the violation. That responsibility leads, along with any other applicable consequences, to a duty to pay compensation if the case demands. Art. 91 Protocol Additional to the Geneva

which are war crimes.<sup>17</sup> Additional Protocol I of 1977 contains a similar provision.<sup>18</sup>

In relation to war crimes involving an AWS, state responsibility may arise, at least in theory, in connection with a variety of scenarios. Arguably, the most relevant are the following four scenarios.<sup>19</sup> First, a state that is obliged to respect a rule of IHL regulating the conduct of hostilities involving an AWS — the violation of which can form the basis of a war crime — is responsible for the breach of that rule. Notably, while the state is responsible for the violation of IHL attributable to it (assuming no circumstance precludes wrongfulness), the state is not responsible for the commission of the war crime as such. That is because a war crime gives rise to individual criminal responsibility, not state responsibility. Secondly, a state is obliged to take certain actions with respect to repression and punishment of war crimes, including war crimes involving

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Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I) (1977), available online at <https://treaties.un.org/pages/showdetails.aspx?objid=08000002800f3586> (visited 17 July 2023) (hereafter ‘AP I’). See also Art. 3 Convention (IV) Respecting the Laws and Customs of War on Land (1907), available online at <https://ihl-databases.icrc.org/en/ihl-treaties/hague-conv-iv-1907> (visited 17 July 2023) (hereafter ‘Hague IV’). International Committee of the Red Cross, *Commentary on the First Geneva Convention: Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field* (2016 Update, CUP, 2016), available online at <https://ihl-databases.icrc.org/ihl/full/GCI-commentary> (visited 17 July 2023), paras 3022, 3025.

17 Art. 85(5) AP I.

18 Art. 91 AP I.

19 In addition to, or alongside, the example situations enumerated in the main text and corresponding footnotes, the following aspects may be borne in mind. A state may be responsible for: i) encouraging a party or other persons or groups to conduct an attack involving an AWS that constitutes a war crime; or ii) its failure to opt out, in the context of multinational operations, of a specific operation involving an attack employing an AWS that constitutes a war crime where there was an expectation, based on the facts or knowledge of past patterns, that the operation would violate IHL. In addition, at least arguably, though controversially, a state may be responsible if it fails: iii) to take proactive steps to use its influence on a relevant party to stop attacks involving an AWS that constitute war crimes; iv) to prevent such attacks where there is a foreseeable risk that they will be conducted; or v) to prevent further such attacks that already occurred.

Furthermore, under general international law, at least as determined by the International Law Commission, states are obliged not to recognize as lawful a situation created by a serious breach of a peremptory norm of general international law and not to render aid or assistance in maintaining such a situation. Art. 41(2) DARSIVA. A breach is serious in this sense if it involves a gross or systematic failure by the responsible state to fulfil the obligation. *Ibid.*, Art. 40(2). Also under general international law as determined by the ILC, states are obliged to cooperate to bring any such serious breach to an end through lawful means. *Ibid.* These obligations may be relevant with respect to war crimes at least inasmuch as relevant parts of IHL and the field of international criminal law pertaining to war crimes embody norms from which no derogation is permitted, which may arguably encompass norms regulating prevention, repression, suppression and punishment of war crimes, including such violations involving an AWS. See *Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory*, Advisory Opinion of 9 July 2004, ICJ Reports (2004) 136, at 199–200; International Committee of the Red Cross, *supra* note 16, para. 163.

an AWS.<sup>20</sup> Provided that no circumstance precludes wrongfulness, the state is responsible where it fails to take such action.<sup>21</sup> This set of obligations owed by the state apply with respect to individuals whose conduct is attributable to the state, including members of its armed forces, as well as to certain individuals whose conduct is not necessarily attributable to the state.<sup>22</sup> Thirdly, a state that aids or assists another state in the commission of an internationally wrongful act by the latter is internationally responsible for doing so if: that state does so with knowledge of the circumstances of the internationally wrongful act; and the act would be internationally wrongful if committed by that state.<sup>23</sup> Such an internationally wrongful act may include a breach of a rule of IHL that forms the basis of a war crime involving an AWS. Fourthly, a state is responsible for conduct concerning an arms transfer related to a war crime involving an AWS where such conduct constitutes a breach of one of the state's treaty obligations. Such a breach may occur, for example, where a state party to the Arms Trade Treaty (2003) fails to perform a relevant obligation with respect to that instrument.<sup>24</sup>

20 Among others: Arts 1, 49–50 GC I; Arts 1, 50–51 GC II; Arts 1, 129–130 GC III; Arts 1, 146–147 GC IV; Arts 1(1), 11(4), 85–90 AP I. Pursuant to Art. 85(5) AP I, without prejudice to the application of GCs I–IV and AP I, grave breaches of these instruments shall be regarded as war crimes.

21 Consider two examples. A state is responsible for its failure to enact legislation necessary to provide effective penal sanctions for persons committing, or ordering to be committed, any of the grave breaches involving an AWS. Art. 49(1) GC I; Art. 50(1) GC II; Art. 129(1) GC III; Art. 146 GC IV. And a state is responsible for its failure to search for alleged perpetrators of a war crime involving an AWS and bring them before the state's courts or hand them over to another state party. Art. 49(2) GC I; Art. 50 GC II; Art. 129(2) GC III; Art. 146(2) GC IV.

22 See *supra* note 14.

23 Art. 16 DARSIIWA. Furthermore, a state is responsible for providing financial, material or other support in the knowledge that the support will be used to conduct an attack involving an AWS that constitutes a war crime. See International Committee of the Red Cross, *supra* note 16, para. 160. In this respect, a violation of the obligation to 'ensure respect' for at least GCs I–IV may arise even if the support does not amount to aiding or assisting in the commission of a wrongful act by the receiving state for purposes of state responsibility. *Ibid.* In addition, a state is responsible where it exercised direction and control over the commission of an internationally wrongful act or the state coerced another state to commit an internationally wrongful act. Arts 17–18 DARSIIWA.

24 In general, a state is responsible where the state transfers an AWS to a recipient state party in a context where there was an expectation, based on facts or knowledge of past patterns, that the AWS would be used to commit a war crime. International Committee of the Red Cross, *supra* note 16, para. 162. Under the Arms Trade Treaty, a state party to that instrument is obliged not to authorize any transfer of covered conventional arms or covered items, if it has knowledge at the time of authorization that the arms or items would be used in the commission of (among other acts) grave breaches of GCs I–IV, attacks directed against civilian objects or civilians protected as such, or 'other war crimes as defined by international agreements' to which the transferring state is a party. Art. 6(3) Arms Trade Treaty (2013), 3013 UNTS 269, available online at [https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg\\_no=XXVI-8&chapter=26](https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-8&chapter=26) (visited 17 July 2023). The covered conventional arms include certain arms that may arguably form, at least in theory, part or all of an AWS, including battle tanks, armoured combat vehicles, large-calibre artillery systems, combat aircraft and missiles and missile launchers. *Ibid.*, Arts 2(1)(a)–(d), (g).

However, at least two sets of issues may pose challenges, at a conceptual level, to ascertaining or applying state responsibility in this area. Both sets pertain to the establishment of an internationally wrongful act related to a breach of a rule of IHL on the conduct of hostilities arising in relation to an employment of an AWS involved in a war crime.

One of those potentially challenging sets of issues concerns attribution to the state. Attribution arguably rests partly on the conditions considered necessary to establish a legal-agency link between a relevant natural person and the conduct and consequences of the use of the AWS. It is settled that state responsibility is entailed in cases where a breach of an IHL rule on the conduct of hostilities arising in relation to an employment of an AWS involved in a war crime is attributable to the state. In this regard, a commentator has argued that the autonomous aspect(s) of an AWS may pose certain conceptual challenges concerning attribution under the criteria of attribution formulated in the International Law Commission's 'Draft Articles on Responsibility of States for Internationally Wrongful Acts'. It is argued that the latter would in principle require that attributable conduct is carried out by a (natural) person or group of (natural) persons.<sup>25</sup> Consequently, the question arises as to whether, in relation to an employment of an AWS, the behaviours and effects that occur may be ascribed, in general, to one or more natural persons and, in particular, to a natural person who, in operating the AWS, acts on behalf of a state party to an armed conflict. That inquiry, in turn, arguably implicates whether a member of the armed forces — and, indeed, more widely, whether *any* natural person — is capable of exercising, with respect to the use of an AWS, the kind and degree of agency necessary to establish a sufficient legal link between herself, on the one hand, and the conduct and consequences related to that use of an AWS, on the other hand. That inquiry depends partly on the conditions necessary for a natural person to exercise legal agency in relation to an employment of an AWS.<sup>26</sup> From the perspective of this article's author, it is not necessarily clear what all those conditions currently are. For example, it is unclear whether one such necessary condition is the capability of a natural person to exercise volition, intention and judgment, and, if so, what those concepts mean in practical terms with respect to the conduct and consequences arising in relation to an employment of an AWS. In addressing these issues, international actors might consider developing a 'special' rule of attribution for the purpose of establishing a state's responsibility for an internationally wrongful act with respect to an employment of an AWS or, at least, of a weapon with an autonomous function, including those involved in a war crime.<sup>27</sup>

25 See B. Boutin, 'State Responsibility in Relation to Military Applications of Artificial Intelligence', 36 *Leiden Journal of International Law* (2023) 133, at 139–143.

26 See D.A. Lewis, 'On "Responsible A.I." in War: Exploring Preconditions for Respecting International Law in Armed Conflict', in S. Voeneky et al. (eds), *The Cambridge Handbook of Responsible Artificial Intelligence: Interdisciplinary Perspectives* (CUP, 2022).

27 On special rules of attribution, see generally M. Milanovic, 'Special Rules of Attribution of Conduct in International Law', 97 *International Law Studies* (2020) 295.



Another set of potentially challenging issues in this area concerns the requirements needed to determine what constitutes a relevant breach of a rule of IHL, to evaluate whether certain circumstances may preclude the wrongfulness of such a breach, and to apply consequences in respect of such a breach whose wrongfulness is not precluded. A relevant breach in this sense is any breach of a rule of IHL on the conduct of hostilities arising in relation to an employment of an AWS, including such uses that form the basis of a war crime. A key question is whether a natural person acting on behalf of a state is capable, from a legal perspective, of sufficiently anticipating and administering the behaviours, performance and effects of the weapon system. That question matters because it implicates whether a natural person can exercise sufficient legal agency in relation to an AWS. The answer might turn partly on the nature or character of the autonomous elements of the weapon system and the kind and degree of human–machine interaction underpinning the system's operation. With respect to state responsibility, that conceptual inquiry may usefully address whether certain employments of an AWS risk interrupting the necessary causality chain for making the state responsible for a relevant breach of a rule of IHL. At least the following three issues are arguably relevant to that assessment: i) whether, under the existing legal framework, fault is a requirement for a relevant breach of IHL;<sup>28</sup> ii) if it is not, whether certain circumstances precluding wrongfulness, such as *force majeure*,<sup>29</sup> may apply in respect of a relevant breach of a rule of IHL; and iii) whether, with respect to an employment of an AWS, mistaken action, error in judgment or reckless conduct may, in light of the high standard of prudence in discipline and control expected of armed forces, form the basis of a relevant breach of a rule of IHL.<sup>30</sup> Those assessments may also help to inform how to conceptualize key elements of state responsibility from a legal perspective with respect to, among other things, purported malfunctions, accidents and errors that arise in relation to an employment of an AWS.<sup>31</sup>

### ***B. Individual Criminal Responsibility for War Crimes Involving an AWS***

Distinct from the collective form of responsibility entailed in state responsibility, individual criminal responsibility is a form of personal responsibility. The ascription of individual criminal responsibility requires a mental element, which, among other distinctions, is not a default requirement for establishing state responsibility. Under international law, individual criminal responsibility may arise in relation to conduct that constitutes an international crime, such as a war crime. For individual criminal responsibility to be ascribed in relation to an actor, the actor must have engaged in proscribed conduct with the

28 Mauri, *supra* note 13, at 220–224.

29 For an evaluation of a plea of *force majeure*, see Mauri, *supra* note 13, at 216–224.

30 *Kling (USA) v United Mexican States* (1930) IV RIAA 575 (Commissioner Nielsen), at 579.

31 See A. Seixas-Nunes, *The Legality and Accountability of Autonomous Weapon Systems: A Humanitarian Law Perspective* (CUP, 2022), at 209–215.

requisite mental element(s) and through a recognized mode of responsibility. Depending on the jurisdiction, penalties may include imprisonment for a specified period, a fine, or forfeiture of proceeds, property and assets derived from the crime — or some combination thereof.<sup>32</sup>

At least in theory, individuals may commit some or all of the prohibited conduct underlying an array of war crimes through actions or omissions<sup>33</sup> related to the use of an AWS. Examples of such conduct may be enumerated with respect to (among other sources) a handful of the potentially relevant provisions in the Statute of the International Criminal Court (ICC Statute). For instance, based on the list of war crimes in international armed conflicts enumerated in the ICC Statute, one can mention, among others, the war crime of intentionally directing attacks against the civilian population as such or against individual civilians not taking direct part in hostilities<sup>34</sup> and the war crime of intentionally directing attacks against civilian objects, that is, objects which are not military objectives.<sup>35</sup> The list of such examples may, however, be much longer. It may also include, for instance: intentionally launching an attack in the knowledge that such attack will cause incidental loss of life or injury to civilians or damage to civilian objects or widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated;<sup>36</sup> attacking or bombarding, by whatever means, towns, villages, dwellings or buildings which are undefended and which are not military objectives;<sup>37</sup> or killing or wounding a combatant who, having laid down his arms or having no longer means of defence, has surrendered at discretion.<sup>38</sup>

As in the case of state responsibility for violations of IHL arising in connection with use of an AWS, certain issues may pose challenges to ascertaining or applying individual criminal responsibility for war crimes involving an AWS. A key question regarding the latter is whether the nature or character of an AWS — and, indeed, of autonomous elements involved in weapon systems generally — might warrant a conceptual reconfiguration of what it means for a natural person to be capable of being held criminally responsible with respect to the behaviours, performance, and effects of a relevant weapon system. That conceptual inquiry may usefully address whether certain employments of autonomous weapons risk interrupting the currently applicable chain of causality for making a natural person responsible for a war crime. At least the following three issues are arguably relevant to that assessment. First, as regards the mental element of intent in relation to a consequence, it may be necessary to determine whether as a legal matter a natural person can, with respect to

32 See e.g. Art. 77 ICCSt.

33 On war crimes through omissions related to the use of an AWS, see Marta Bo's contribution to this Special Issue of the *Journal*.

34 Art. 8(2)(b)(i) ICCSt.

35 *Ibid.*, Art. 8(2)(b)(ii).

36 *Ibid.*, Art. 8(2)(b)(iv).

37 *Ibid.*, Art. 8(2)(b)(v).

38 *Ibid.*, Art. 8(2)(b)(vi).

an AWS whose specific behaviours and effects cannot be reasonably anticipated, mean to cause a consequence or be aware that it will occur in the ordinary course of events.<sup>39</sup> Secondly, with regard to co-perpetration as a mode of responsibility, at least under the ICC Statute, it may be necessary to establish what may constitute a coordinated essential contribution by each co-perpetrator with respect to conduct involving an AWS.<sup>40</sup> That is partly because the essential tasks related to an employment of an AWS might involve numerous people across the development-and-use cycle of the weapon system. And thirdly, it may be necessary to establish whether any of the bases to exclude criminal responsibility may be applied with respect to conduct involving an AWS. That is partly because certain potential challenges in establishing the mental element of intent, perhaps especially in relation to a consequence, may entail implications as to whether a mistake of fact may negate the mental element required by the war crime involving an AWS.<sup>41</sup>

### 3. The Question of State ‘Liability’ in relation to War Crimes Involving an AWS

The term ‘liability’ is not infrequently employed in debates concerning international legal aspects of autonomous weapons, including as they may relate to war crimes. Notably, however, it is not always clear whether the term is assumed to be synonymous with ‘responsibility’ or whether it has a distinct meaning. At a conceptual level, at least three notions of (state) liability in contemporary international law should be distinguished. Only two of them, which are interrelated, appear to pertain in practice, at least to date, to a war crime involving an AWS.

One notion of liability related to potentially salient violations of rules of IHL appears to be more or less coterminous with the international responsibility entailed in situations in which a state commits an internationally wrongful act. As explained above, in relation to war crimes involving an AWS, state responsibility may arise, at least in theory, in connection with various scenarios. The term ‘liability’, for example, is apparently used to denote responsibility, in the sense of state responsibility for a wrongful act, at least in the English texts of provisions concerning grave breaches in the four Geneva Conventions of 1949 and the first Additional Protocol thereto.<sup>42</sup>

A second salient notion of liability refers to consequences of international responsibility concerning the obligation to pay compensation for the damage

<sup>39</sup> *Ibid.*, Art. 30.

<sup>40</sup> *Ibid.*, Art. 25(3)(a) 2nd alternative.

<sup>41</sup> See Antonio Coco’s contribution to this Special Issue of the *Journal*.

<sup>42</sup> GCs I–IV, *supra* note 16, lay down that no state party shall be allowed to absolve itself or any other state party to one of those instruments of ‘any liability’ incurred by itself or by another state party in respect of grave breaches. As noted above, while ‘any liability’ is used in the English text, ‘*des responsabilités*’ is used in the equally authentic French text.

caused by a wrongful act.<sup>43</sup> From a legal perspective, that obligation to pay compensation is distinct from *ex gratia* payments, characterized as condolence payments that do not reflect an admission of a breach of rules of IHL; the United States, for example, has made such *ex gratia* payments.<sup>44</sup> This second notion of liability (concerning an obligation to pay compensation) constitutes an element of the first notion of liability (concerning responsibility for a wrongful act). Due to the potential for conceptual confusion, it may be preferable to use the term ‘responsibility’ alone to denote responsibility in the sense of state responsibility for a wrongful act in this area.

A third notion of liability refers to situations in which a state has a duty to take preventive and reparatory measures vis-à-vis other states for damage caused, or likely to be caused, by activities carried out under its jurisdiction, irrespective of the unlawfulness of the conduct by the origin state.<sup>45</sup> This notion of liability most often pertains to transboundary industrial, mining, energy-production, or transport activities considered hazardous but not unlawful.<sup>46</sup> So-called absolute or strict liability, as a form of this notion of liability, may be found in treaty law with regard to certain ultra-hazardous activities.<sup>47</sup> So far as one can detect, this third notion of state liability does not appear to have been instantiated (at least to date) in the international law of armed conflict, including with respect to preventing, repressing, or punishing war crimes.<sup>48</sup>

43 A. Tanzi, ‘Liability for Lawful Acts’, in A. Peters (ed.), *Max Planck Encyclopedia of Public International Law* (OUP, 2021 update), para. 2; Art. 91 AP I; Art. 3 Hague IV. See also J-M. Henckaerts et al. (eds), *Customary International Humanitarian Law* (CUP, 2005) 537–550. It may be noted that, in the non-authentic English translation, Art. 3 Hague IV encompasses both the first notion and the second notion of liability: ‘A belligerent party which violates the provisions of the said Regulations shall, if the case demands, be liable to pay compensation [ed.: second notion]. It shall be responsible [ed.: first notion] for all acts committed by persons forming part of its armed forces.’ (emphasis added). The authentic French text provides: ‘La Partie belligérante qui violerait les dispositions dudit Règlement sera tenue à indemnité, s’il y a lieu. Elle sera responsable de tous actes commis par les personnes faisant partie de sa force armée.’

International investment arbitration case law and proceedings in the International Tribunal for the Law of the Sea use the word ‘liability’ to refer to consequences of international responsibility with regard to the obligation to pay compensation for the damage caused by a wrongful act. Tanzi (this note) at para. 2.

44 See e.g. M. Lattimer, ‘Civil Liability for Violations of IHL: Are the US and UK moving in Opposite Directions?’, EJIL:Talk! Blog of the European Journal of International Law, 28 October 2022, available online at <https://www.ejiltalk.org/civil-liability-for-violations-of-ihl-are-the-us-and-uk-moving-in-opposite-directions/> (visited 28 February 2023).

45 Tanzi, *supra* note 43, para. 2.

46 *Ibid.*, para. 1.

47 See *ibid.*, para. 16; Art. II Convention on International liability for Damage Caused by Space Objects (1972), 961 UNTS 187, available online at <https://treaties.un.org/pages/showdetails.aspx?objid=08000002801098c7> (visited 17 July 2023); Art. 8(3)lit. a Convention on the Regulation of Antarctic Mineral Resource Activities (1988) (not in force), available online at [https://www.ats.aq/documents/recatt/Att311\\_e.pdf](https://www.ats.aq/documents/recatt/Att311_e.pdf) (visited 17 July 2023).

48 But, see, arguments in favour of legal reform or development in this area, e.g., R. Crotoft, ‘War Torts’, 97 *New York University Law Review* (2002) 1063–1141; Mauri, *supra* note 34, at 224–230; N.J.E. Nunn, ‘Creating Legal Frameworks to Afford Human Accountability for AI Decisions in War’ in Emma Palmer et al. (eds), *Futures of International Criminal Justice* (Routledge, 2021), at 210–217.

Nevertheless, international actors may consider whether the nature or character of autonomous weapon systems, or, at least, autonomy in weapon systems, may warrant the development of this notion of liability with respect to conduct that relates to an employment of an AWS.

#### 4. A Word on Debates Related to an Alleged ‘Accountability Gap’ Concerning War Crimes Involving an AWS

In academic and intergovernmental debates on autonomous weapon systems, the term ‘accountability’ has carried many values, meanings and appeals. This multivalent character may be witnessed across a span of denotations supplied by various actors: from implementing responsibility for legal violations, to seeing accountability as a duty obliging an explanation for one’s actions,<sup>49</sup> or holding oneself or others (otherwise) answerable for the exercise of power and authority in relation to an AWS.<sup>50</sup> These debates on accountability concerning autonomous weapons have variously clarified and obscured relevant aspects of the legal framework. In the initial phase of the debate, many contributors framed their interventions as seeking to address whether an ‘accountability gap’ existed — and, if so, what legal reform was necessary to fill it.<sup>51</sup> Much, though not all, of that debate was, however, cast fundamentally in ethical and moral terms. Among the questions that predominated included whether it was ethically permissible for ‘robots’ to ‘decide’ whom to kill and whether it was theoretically possible to hold a ‘killer robot’ ‘responsible’ for a war crime. It was not uncommon for those involved in exploring these questions to anthropomorphize autonomous weapons.

Notably, many of the moral and ethical issues identified in the early part of the debate were not necessarily susceptible to being transposed automatically into the existing international law of armed conflict and related responsibility concepts and institutions. Partly as a result, much of the initial accountability-related debate made it difficult to understand the distinctions among the potentially implicated regimes of international responsibility. Moreover, even where it was couched in legal terms, a not-insignificant part of the initial phase of debate focused on whether it was theoretically and practically possible to ascribe responsibility for a war crime to an AWS. State responsibility was

49 See I. Verdiesen, F. Santoni de Sio, and V. Dignum, ‘Accountability and Control Over Autonomous Weapon Systems: A Framework for Comprehensive Human Oversight’, 31 *Minds and Machines* (2021) 137.

50 See D.A. Lewis, G. Blum, and N.K. Modirzadeh, ‘War-Algorithm Accountability’, *Harvard Law School Program on International Law and Armed Conflict* (2016), available online at <https://dash.harvard.edu/handle/1/28265262> (visited 17 July 2023).

51 For a summary, see E. Schwarz, ‘Delegating Moral Responsibility in War – Lethal Autonomous Weapons Systems and the Responsibility Gap’, in H. Hansen-Magnusson, and A. Vetterlein (eds), *The Routledge Handbook on Responsibility in International Relations* (Routledge, 2022), at 179–182.

often overlooked or, at least, confused with individual criminal responsibility.<sup>52</sup> Furthermore, the (potential) responsibility under international law of other actors — such as international organizations, non-state armed groups or private corporations — was often disregarded or, at least, formulated in terms that blurred legal requirements with policy preferences. In addition, it was relatively rare for those involved in the debate to take into account how armed forces sought to respect the law in practice, including as relates to acquiring, reviewing, testing, employing and assessing the lawfulness of operations involving weapons with autonomous functions.<sup>53</sup>

In more recent years, debates on accountability-related aspects of autonomous weapons systems have, more extensively, addressed certain aspects of state responsibility.<sup>54</sup> Furthermore, several international actors have sought to evaluate prospects for accountability by defining and instantiating such concepts as exercising ‘meaningful human control (and judgment)’ with respect to an autonomous weapon.<sup>55</sup> And, in the context of the Convention on Certain Conventional Weapons (CCW), a Group of Governmental Experts (GGE) on Emerging Technologies in the Area of Lethal Autonomous Weapon Systems (LAWS) has agreed on two principles that pertain expressly to accountability: i) ‘[h]uman responsibility for decisions on the use of weapons systems must be retained since accountability cannot be transferred to machines. This should be considered across the entire life cycle of the weapons system’; and ii) ‘[a]ccountability for developing, deploying and using any emerging weapons system in the framework of the CCW must be ensured in accordance with

52 For counter-examples that do not overlook such issues, see R. Geiß, ‘The International-Law Dimension of Autonomous Weapons Systems’, Friedrich-Ebert-Stiftung, October 2015, available online at <https://library.fes.de/pdf-files/id/ipa/11673.pdf> (visited 17 July 2023), at 22–23; N. Weizmann, ‘Autonomous Weapon Systems under International Law’, Geneva Academy of International Humanitarian Law and Human Rights, 2014, Academy Briefing No. 8, available online at [https://www.geneva-academy.ch/joomlatools-files/docman-files/Publications/Academy%20Briefings/Autonomous%20Weapon%20Systems%20under%20International%20Law\\_Academy%20Briefing%20No%208.pdf](https://www.geneva-academy.ch/joomlatools-files/docman-files/Publications/Academy%20Briefings/Autonomous%20Weapon%20Systems%20under%20International%20Law_Academy%20Briefing%20No%208.pdf) (visited 17 July 2023), at 23–24.

53 For a counter-example that takes such issues into account, see M.A.C. Ekelhof, ‘The Distributed Conduct of War: Reframing Debates on Autonomous Weapons, Human Control and Legal Compliance in Targeting’ (Dissertation: Vrije Universiteit Amsterdam, 2019) available online at <https://research.vu.nl/en/publications/the-distributed-conduct-of-war-reframing-debates-on-autonomous-we> (visited 17 July 2023).

54 See e.g. Bo, Bruun, and Boulanin, *supra* note 7; V. Boulanin, L. Bruun, and N. Goussac, ‘Autonomous Weapon Systems and International Humanitarian Law - Identifying Limits and the Required Type and Degree of Human-Machine Interaction’, Stockholm International Peace Research Institute, 2021 available online at [https://www.sipri.org/sites/default/files/2021-06/2106\\_aws\\_and\\_ihl\\_0.pdf](https://www.sipri.org/sites/default/files/2021-06/2106_aws_and_ihl_0.pdf) (visited 17 July 2023).

55 See e.g. International Committee of the Red Cross, ‘ICRC Position on Autonomous Weapon Systems’, ICRC, 2021 available online at [https://www.icrc.org/en/download/file/166330/icrc\\_position\\_on\\_aws\\_and\\_background\\_paper.pdf](https://www.icrc.org/en/download/file/166330/icrc_position_on_aws_and_background_paper.pdf) (visited 17 July 2023); H.M. Roff and R. Moyes, ‘Meaningful Human Control, Artificial Intelligence and Autonomous Weapons’, Article 36, 2016 (Briefing paper for delegates at the Convention on Certain Conventional Weapons (CCW) Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS)), available online at <https://article36.org/wp-content/uploads/2016/04/MHC-AI-and-AWS-FINAL.pdf> (visited 17 July 2023).

applicable international law, including through the operation of such systems within a responsible chain of human command and control'.<sup>56</sup>

Zooming out, one can discern that, where the debate has been couched in terminology and concepts drawn from IHL, much of the 'accountability gap'-centred debate on AWS has relied on often-unarticulated assumptions about how that field of law is meant to operate in theory and how it functions in practice. Those assumptions relate to such things as: i) whether an AWS is capable of exercising legal agency; ii) whether armed forces want to and will employ weapons whose behaviours and effects cannot be reasonably anticipated or controlled; and iii) whether IHL-required evaluative decisions and value judgments in targeting decisions may be made only by natural persons (not by artificial agents).<sup>57</sup> Depending partly on where one stands, expressly or impliedly, on those and other assumptions, existing international law has been characterized as, on one end of the spectrum, mostly sufficient to meet the challenges that autonomous weapons may pose<sup>58</sup> and, on the other end, urgently requiring new law, whether in the form of prohibitions, regulations or both.<sup>59</sup>

Of the three concepts or institutions under evaluation here, namely, responsibility, liability and accountability, it is accountability that arguably has the least direct root in the international law of armed conflict or general international law. State responsibility is recognized as a cardinal institution of international law. Individual criminal responsibility constitutes an internationally recognized regime stretching back many decades. And state liability for activities not prohibited by international law is accepted at least in connection with a handful of discrete areas mentioned above, even if it has not (yet) been instituted in relation to armed conflict. Meanwhile, for its part, the English

56 Meeting of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, 'Final Report', CCW, CCW/MSP/2019/9, 13 December 2019, at 10, available online at <https://undocs.org/CCW/MSP/2019/9> (visited 17 July 2023).

57 See D.A. Lewis, 'Three Pathways to Secure Greater Respect for International Law Concerning War Algorithms', *Harvard Law School Program on International Law and Armed Conflict*, (2020), available online at <https://pilac.law.harvard.edu/three-pathways-to-secure-greater-respect-for-international-law-concerning-war-algorithms> (visited 13 September 2022), at 9–12.

58 E.g. Australia and others, 'Principles and Good Practices on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems' (2022), available online at <https://www.disarm.emb-japan.go.jp/Final%20proposal%20-%20laws%20principles%20and%20good%20practices%20-%20March%207%202022.pdf> (visited 17 July 2023).

59 E.g. Argentina and others, 'Written Commentary by the Delegations of Argentina, Costa Rica, Ecuador, Guatemala, Kazakhstan, Nigeria, Panama, Peru, the Philippines, Sierra Leone, State of Palestine, Uruguay, Calling for a Legally-Binding Instrument on Autonomous Weapon Systems' (2022) available online at [https://reachingcriticalwill.org/images/documents/Disarmament-fora/ccw/2022/gge/documents/G12\\_March2022.pdf](https://reachingcriticalwill.org/images/documents/Disarmament-fora/ccw/2022/gge/documents/G12_March2022.pdf) (visited 17 July 2023); International Committee of the Red Cross, 'ICRC Position on Autonomous Weapon Systems', ICRC, (2021) available online at [https://www.icrc.org/en/download/file/166330/icrc\\_position\\_on\\_aws\\_and\\_background\\_paper.pdf](https://www.icrc.org/en/download/file/166330/icrc_position_on_aws_and_background_paper.pdf) (visited 17 July 2023).

term ‘accountability’ is not set out in a contemporary treaty provision or customary rule in the international law of armed conflict. Nor may a common definition of the term arguably be deduced from general international law.

Yet despite — or, perhaps, partly because of — this lack of a stable international legal definition of the term, accountability is regularly invoked in debates on autonomous weapons. Notably, conceptual confusion may arise where accountability is used in deliberations on war crimes involving an AWS as a synonym for state responsibility for wrongful acts, for individual criminal responsibility, or for state liability for specific lawful-but-hazardous activities. It might thus be argued that accountability could, rather, more usefully refer to situations in which actors are expected, or even required, to explain or otherwise account for their actions and omissions related to a war crime involving an AWS in a situation where there is a real possibility that political, legal, social or other consequences may arise in respect of such an explanation or a lack thereof. Under this approach, accountability could, but need not, be grounded in or otherwise linked to respecting international law or instituting legal proceedings. The decisions and conduct of a range of actors would fall under a wide umbrella, possibly including: i) political leaders who authorize the development, use, transfer or acquisition of an AWS involved in a war crime; ii) technical personnel who contribute to the design, construction or testing of an AWS involved in a war crime; iii) legal advisers who contribute to a review, or who provide legal advice concerning an employment, of an AWS involved in a war crime; iv) commanders who decide to employ an AWS involved in a war crime; and v) operators who administer an employment of an AWS involved in a war crime.

## 5. Conclusion

A greater shared understanding of the relevant existing international legal fields, concepts and institutions may help enhance legal security and normative stability in this area, which is currently marked by a measure of (potentially significant) divergence among certain sets of states. Meanwhile, significant legal issues concerning war crimes involving an AWS remain to be resolved. A critically oriented, more detailed, and more systematic assessment of the nature, structure and content of existing obligations and their accompanying responsibility institutions may provide a better basis on which concerned actors can evaluate — and, as warranted, develop — the legal framework related to (non-)use of autonomous weapons in armed conflict. To help maximize the potential for the legal framework to guide behaviour in relation to war, such an analysis ought to be accompanied by a factually based evaluation of the extent to which international actors currently do, and do not, uphold their existing commitments in practice, including those that pertain to weapons with autonomous characteristics. Furthermore, any such assessment ought to be informed by a wider examination of how and why the vast majority of war crimes committed in contemporary armed conflicts go uninvestigated or, at least, unpunished.