

## THE LEGALITY AND ACCOUNTABILITY OF AUTONOMOUS WEAPON SYSTEMS

By adopting a multi-disciplinary approach, this book provides a comprehensive analysis of the legality of the use of autonomous weapons systems under international law. It examines different arguments presented by States, roboticists and scholars to demonstrate the challenges such systems will create for the laws of war. This study examines how technology of warfare seeks to increase the dissociation of risk and communication between weapons and their human operators. Furthermore, it explains how algorithms might give rise to 'errors' on the battlefield that cannot be directly attributed to human operators. Against this backdrop, Dr Seixas-Nunes examines three distinct legal frameworks: the distinction between the legality of weapons and the laws of targeting; different mechanisms of individual accountability and the importance of recovering the category of 'dolus eventualis' for programmers and technicians and, finally, State responsibility for violations of the laws of war caused by weapons' software errors.

Afonso Seixas-Nunes, Jesuit Priest, graduated in Law, Philosophy (Vitorino Sousa Alves Award) and Theology, and holds an Mst in Human Rights from the London School of Economic and a PhD from the University of Essex. He was a visiting scholar at the Oxford Institute for Ethics, Law and Armed Conflict and since July 2021 he joined the University of St Louis School of Law (SLU-Law).

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Afonso Seixas-Nunes

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# The Legality and Accountability of Autonomous Weapon Systems

A HUMANITARIAN LAW PERSPECTIVE

AFONSO SEIXAS-NUNES

University of Oxford



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*To my mother. . .*

*To Casa do Casal, Cabeceiras de Basto*

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Abbreviations

AGI	artificial general intelligence
AI	artificial intelligence
AMW Manual	Manual on International Law Applicable to Air and Missile Warfare
API	First Additional Protocol to the 1949 Geneva Conventions, relating to the Protection of Victims of International Armed Conflicts (1977)
APII	Second Additional Protocol to the 1949 Geneva Conventions, relating to the Protection of Non-International Armed Conflicts (1977)
ARSIWA	Draft Articles on the Responsibility of States for Internationally Wrongful Acts
AWS	autonomous weapons system
CCF	continuous combat function
CCM	Convention on Cluster Munitions
CCW	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
CDEM	collateral damage estimate methodology
DARPA	United States Defense Advanced Research Projects Agency
DoD	United States Department of Defense
DPH	direct participation in hostilities
EBO	effects-based operation
EG	AWS ethical governor
EU	European Union

*List of Abbreviations*

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Final Report 2021	United States National Security Commission on AI Final Report 2021
GDPR	General Data Protection Regulation
GEE	Group of Governmental Experts at the CCW
GGE 2019 Report	Report of the 2019 session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems (25–29 March and 20–21 August 2019)
GOFAI	good old-fashioned artificial intelligence
GPS	global positioning systems
HBI	human-based intelligence
House of Lords Report	2018 House of Lords Report on Artificial Intelligence
HRW	Human Rights Watch
ICC	International Criminal Court
ICC Statute	1998 Rome Statute of the International Criminal Court
ICJ	International Court of Justice
ICL	international criminal law
ICRAC	International Committee for Robots Arms Control
ICRC	International Committee of the Red Cross
ICTR	International Criminal Tribunal for Rwanda
ICTY	International Criminal Tribunal for the Former Yugoslavia
IHL	international humanitarian law
IHRC	Harvard International Human Rights Clinic
IHRL	international human rights law
ILC	International Law Commission
Interpretative Guidance	ICRC Interpretative Guidance on the Notion of Direct Participation in Hostilities under International Humanitarian Law
JIT	joint investigation team
JURI	European Parliament's Committee on Legal Affairs
LOAC	Law of Armed Conflict
LOW	Laws of war
LWM	United States Department of Defense Law of War Manual

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MHC	meaningful human control
MoD	United Kingdom Ministry of Defence
NATO	North Atlantic Treaty Organization
NGO	non-governmental organisation
OPLAN	operational plan
Oslo Manual	Oslo Manual on Select Topics of the Law of Armed Conflict
OTP	Office of the Prosecutor
PGM	precise guided munitions
PTSD	post-traumatic stress disorder
Roadmap 2013–2018	Unmanned Systems integrated Roadmap: FY2013–2038
ROE	rules of engagement
RPE	ICC Rules of Procedure and Evidence
<i>Sanremo Handbook</i>	<i>Sanremo Handbook on Rules of Engagement</i> (2009)
SAWS	supervised autonomous weapon systems
SCO	Shanghai Cooperation Organisation
SI	swarm intelligence
STL	Special Tribunal for Lebanon
Tallinn Manual	Tallinn Manual 2.0 on International Law Applicable to Cyber Warfare
Task Force Report	2012 Task Force Report: The Role of Autonomy in DoD Systems
UK JDN 2/11	United Kingdom Approach to Unmanned Aircraft Vehicles, 2011
UK JDP 0–30.2	Joint Doctrine Publication 0–30.2 Unmanned Aircraft Systems
UN Charter	Charter of the United Nations of 26 June 1945, as amended on 17 December 1963, 20 December 1965 and 20 December 1971
UNIDIR	United Nations Institute for Disarmament Research
USA DoD	United States Department of Defence
UWI	unified web-intelligence
WSO	weapon system officer
XAI	explainable AI