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Book Title: The AI Wave in Defence Innovation: Assessing Military Artificial Intelligence Strategies, Capabilities and Trajectories

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Advancements in Artificial Intelligence (AI) and Machine Learning (ML) pose pressing questions related to evolution of military power, compliance with international humanitarian law, peace promotion, strategic stability, arms control and technology race.

Edited by Michael Raska and Richard A. Bitzinger the book, *The AI Wave in Defence Innovation: Assessing Military Artificial Intelligence Strategies, Capabilities and Trajectories*, comprises introduction and ten chapters: (i) Artificial Intelligence in Warfare: Military Uses of AI and Their International Security Implications; (ii) AI and Technological Convergence: Catalysts for Abounding National Security Risks in the Post-COVID-19 World; (iii) AI Ethics and Governance in Defence Innovation: Implementing AI Ethics Framework; (iv) European Military AI: Why Regional Approaches Are Lagging Behind; (v) US Governance of Artificial Intelligence for National Security: Competitive Advantage from the Moral High Ground?; (vi) China's Evolving AI Development: Emergent Process Transcending Instrumentalism and Morality; (vii) Assessing Russia's National Strategy for AI Development; (viii) Military AI Developments in Russia; (ix) Comparing Military AI Strategic Perspective: Japan and South Korea; and (x) Australia's Approach to AI Governance in Security and Defence. The book assesses an international and interdisciplinary perspective on the adoption and governance of AI and ML in defence and military innovation by major and middle powers.

In the first chapter authors Jean-Marc Rickli and Federico Mantellasi introduced three schools of thought regarding the influence of AI on warfare: enthusiasts, deniers and pragmatics. These schools of thought do not differ in their recognition of the recent advances in the field of military AI, but in their view of the potential for these advances to be utilised in a military setting. In short, the debate centres on whether and to what extent AI will influence the character of war. Further, the chapter takes stock of the current and prospective uses of AI on the battlefield, showing that military AI is already a reality serving as an analytical enabler, disruptor and force multiplier. It argues that AI's current and potential future military applications and the commercial nature further increases the impact of AI on strategic stability, as it facilitates the proliferation of the technology, increasing the number of actors that have access to disruptive technologies.

Second chapter, written by Tate Nurkin focuses on the increasing necessity of AI and ML in defence and security domains. The book identifies five crucial categories where AI plays a transformative role.

Firstly, situational awareness which involves the use of AI Algorithms to process vast data for enhanced understanding. Secondly, hyper-enabled platforms and people, where AI augments human capabilities and enhances the performance of military systems. Thirdly, new efficiencies in “Design Age” which refer to the use of AI in cost reduction and accelerating innovation. Fourthly, connectivity and lethality, where AI facilitates Lethal Autonomous Weapon Systems (LAWS). Lastly, monitoring and manipulation of AI enabled surveillance and propaganda tools. The chapter underscores the importance of optimizing human-machine collaboration for stronger, faster and more resilient defence capabilities.

Third chapter authored by Cansu Canca discusses ethical considerations in AI decision making. The author presents PiE model, an AI and governance framework comprising three key components: (i) AI ethics; (ii) Process; and (iii) People. The chapter concludes by presenting some further considerations, such as accountability. AI ethics framework supported by regulations would function as an external enforcing mechanism to define the boundaries of legally acceptable actions and to establish a fair playing field for competition.

Fourth chapter authored by Simona R. Soare highlights the global revolution in military, driven by AI advancement. The author examines strategies and capabilities of major powers, focusing on the US, China and Europe. It emphasizes the strategic leveraging of collaborative European Union and NATO formats to enhance AI capabilities and promote technological sovereignty.

Fifth chapter by Zoe Stanley-Lockman discusses chronicles of the US security and defence policy on AI and ML. The author analyses the Department of Defence’s (DoD) role in governance and the influence of National Security Commission on AI in shaping comprehensive policies. After defining the stakes of the US government in AI in the current strategic context, answer is provided in three sections. First explains how DoD has cemented its leadership role in AI/ML governance. Second explains how the National Security Commission on Artificial Intelligence (NSCAI) is attempting to promote a more comprehensive AI policy. Third analyzes external relationships with the private sector, academia, and international actors to assess their influence on the US AI governance for national security.

Sixth chapter written by Qi Haotian addresses concerns about the potential impact of AI development on strategic and operational stability, with specific focus on China’s perspective. There are concerns that the development of AI in military affairs can harm the stability between major military powers like the United States and China. In all fields of AI utilisation, the following concerns address the current and future roles of AI: accountability, safety and security, reliability, explicability, adaptability, human control and responsibility. China sees the advances in AI as a way to enhance its national competitiveness and security in both

civilian and military domains. China also has the largest number of AI patents globally, slightly ahead of the US and Japan. The combined number of patent disclosures of these three countries amounts to 74% of the global total.

Seventh and eighth chapters authored by Vadim Kozyulin and Samuel Bendett discuss Russia's National Strategy on AI development and AI based defence and security. Russia plans to achieve this goal by supporting scientific research, developing software, increasing the availability and quality of data and hardware, supporting export of Russian products, training and attracting foreign specialists and private investment. These chapters acknowledge the evolving debate on military use of AI in Russia and its potential impact on defence and security and also highlight the need for Russia to address technological challenges while integrating AI into its military. As stated by Russian President Vladimir Putin, "Artificial intelligence is the future, not only for Russia, but for all humankind. It comes with colossal opportunities but also threats that are difficult to predict. Whoever becomes the leader in this sphere will become the ruler of the world." In 2020, Russian Ministry of Defence announced research on new generation of military systems with AI with a budget of USD 5 million. In the wake of Ukraine crisis, Russia's "technological sovereignty", a concept described as diminished dependence on imported Western technology and growing reliance on the domestic ability to produce key high-tech systems by industries of strategic importance, such as AI, has also evolved.

Ninth chapter contributed by Ryo Hinata-Yamaguchi compares developments in Japan and South Korea regarding military AI and its governance. The author explores the rationale and applications of AI in military. The chapter further looks at the ethical debate concerning AI-based systems and research and development (R&D). Several internal and external factors rationalise Japan and the South Korea's pursuit of the development and application of AI for defence. First is threat based defence planning, eyeing the developments in China, Russia and North Korea. Second is the universal recognition of AI as a vital technology. Third is the importance of AI and robotics for Japan and South Korea in relation to their demographic challenges. Fourth is the use of AI as an enabler and driver of their military applications. Fifth is the significance of AI-equipped systems for boosting arms exports and trade. Utilisation of AI for national defence is also present in South Korea's Defence Reform 2.0, which encourages the use of scientific and technological advancements of the Fourth Industrial Revolution to overcome resource constraints and adapt to future battlefields.

Tenth chapter authored by Kate Devitt and Damian Copeland begins with Australia's strategic position, definition of AI and identifying the Australian Defence Organisation's (ADO) priorities. It then moves into AI governance initiatives and specific efforts to develop frameworks for

ethical AI in both civilian and military contexts. The chapter emphasises the need for a coordinated approach, encompassing policy framework, investment in research and development and international partnerships to ensure the effective and responsible development of AI while mitigating potential risks. While Australia has not adopted an AI governance framework specifically for Defence, *A Method for Ethical AI in Defence (MEAID)* published by ADO includes a framework and pragmatic tools for managing ethical and legal risks relating to military applications of AI.

The book offers a comprehensive analysis of the impact of AI on defence and security policies of states. It explores various aspects of AI including its strategic impact, ethical considerations and governance frameworks. The book underscores the need for a responsible approach to AI development and its applications, including through international cooperation.

