

# **Artificial Intelligence and Global Security**

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# **Artificial Intelligence and Global Security: Future Trends, Threats and Considerations**

**EDITED BY**

**YVONNE R. MASAKOWSKI**

US Naval War College, USA



United Kingdom – North America – Japan – India – Malaysia – China

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INVESTOR IN PEOPLE

*This book is dedicated to all military personnel who place their lives on the line to preserve our freedoms. I would like to thank my family and US Naval War College friends and colleagues, especially Dr. Timothy J. Demy and Dr. William F. Bundy for their encouragement and support. Special thanks to those military students whom I had the privilege to teach and mentor during my tenure as a Professor at the US Naval War College. Special appreciation to my students from the Ethics and Emerging Military Technologies (EEMT) graduate certificate program for many hours of exciting and inspirational discussion on Artificial Intelligence and future warfare. These Officers are the military's brightest officers selected as students at the Naval War College. These officers are our nation's future military leaders.*

**If** you want one year of prosperity, grow grain.

**If** you want ten years of prosperity, grow trees.

**If** you want one hundred years of prosperity, grow leaders.

*Chinese Proverb*

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The book was written by researchers and authors across many disciplines and domains – Artificial Intelligence (AI), autonomous unmanned systems, undersea, space, as well as humanitarian crises, including the ethical, theological, and moral conflicts of war. These areas and topics encompass numerous moral and ethical issues. Among the questions these chapters will explore are: What are the implications of AI for the individual, for personal identity, privacy, and freedom, and for society? What are the consequences of AI advances related to national and global security? These chapters will examine the perspectives and consequences for the integration of AI in our daily lives, as well as its influence on society and war. Authors will present their perspectives on the potential for significant consequences related to the impact of AI on an individual's identity that may place society at risk. What are the moral and ethical boundaries and responsibilities of each person's life as AI blends with humans into the whole of society? Does humanity lose its identity in the process? Where are the lines drawn between AI systems and the human? These are but a few of the questions that will be examined in these chapters. Whatever the course of action, AI will continue to be part of our future world. As such, humans must chart a course of action to navigate the waters of the future that we design for ourselves.

**Chapter 1 Artificial Intelligence and the Future Global Security Environment**

*Yvonne R. Masakowski*

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Advances in Artificial Intelligence (AI) technologies and Autonomous Unmanned Vehicles will shape our daily lives, society, and future warfare. This chapter will explore the evolutionary and revolutionary influence of AI on the individual, society, and warfare in the twenty-first-century security environment. As AI technologies evolve, there will be increased reliance on these systems due to their ability to analyze and manage vast amounts of data. There are numerous benefits in applying AI to system designs that will support smart, digital cities, as well as support the future warfighter. However, advances in AI-enabled systems do not come without some element of risk (Hawking, Musk, & Wozniak, 2015). For the military, AI will serve as a force multiplier and will have a direct impact on future global security. The military seeks to exploit advances in AI and autonomous systems as a means of achieving technological superiority over their adversaries. We will explore the advantages and potential risks associated with the emergence of AI systems in the future battlespace (Armstrong, Bostrom, & Shulman, 2016). This chapter will serve as the foundation for examining issues such as ethical decision-making, moral reasoning, etc., related to the integration of AI systems in our daily lives, as well as in the future battlespace. Consequences for integrating AI into all aspects of society and military operations will be explored, as well as the implications for future global security.

**Chapter 2 Artificially Intelligent Techniques for the Diffusion and Adoption of Innovation for Crisis Situations**

*Thomas C. Choinski*

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The diffusion and adoption of innovation propels today's technological landscape. Crisis situations, real or perceived, motivate communities of people to take action to adopt and diffuse innovation. This chapter will discuss the ability of Artificial Intelligence to resolve the challenges confronting the diffusion and adoption of innovation. Capacity, risk, resources, culture, complexity, ethics, and emerging situations affect the pace of diffusion and adoption. Artificial Intelligence can search the solution space, identify potential solutions, reduce risk, and mitigate unintended consequences while addressing the value proposition in order to chart courses of action through social networks. In doing so, artificial intelligence can accelerate the diffusion and adoption of technological innovation and contribute to the resolution of immediate crisis situations, as well as chart courses of action through emerging landscapes. However, Artificial Intelligence can help humans, but not replace their role this process. Achieving this goal will require a better understanding of human and machine interaction.



### **Chapter 3 “Something Old, Something New” – Reflections on AI and the Just War Tradition**

*Timothy J. Demy*

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This chapter will focus on the relationship between the centuries-old and prevailing tradition of warfare in the West and the innovations and challenges of AI with respect to the tradition and emerging norms of warfare. It will investigate whether the nature of warfare is changing or the weapons of warfare are changing and how such change affects the normative framework.

### **Chapter 4 Space War and AI**

*Keith A. Abney*

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New technologies, including AI, have helped us begin to take our first steps off the Earth and into outer space. But conflicts inevitably will arise and, in the absence of settled governance, may be resolved by force, as is typical for new frontiers. But the terrestrial assumptions behind the ethics of war will need to be rethought when the context radically changes, and both the environment of space and the advent of robotic warfighters with superhuman capabilities will constitute such a radical change. This chapter examines how new autonomous technologies, especially dual-use technologies, and the challenges to human existence in space will force us to rethink the ethics of war, both from space to the Earth, and in space itself.

### **Chapter 5 Building an Artificial Conscience: Prospects for Morally Autonomous Artificial Intelligence**

*William D. Casebeer*

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Discussions of ethics and Artificial Intelligence (AI) usually revolve around the ethical implications of the use of AI in multiple domains, ranging from whether machine learning trained algorithms may encode discriminatory standards for face recognition, to discussions of the implications of using artificial intelligence as a substitute for human intelligence in warfare. In this chapter, I will focus on one particular strand of ethics and AI that is often neglected: whether we can use the methods of AI to build or train a system which can reason about moral issues. Here, I discuss (1) what an “artificial conscience” consists of and what it would do, (2) why we collectively should build one soon given the increasing use of AI in multiple areas, (3) how we might build one in both architecture and content, and (4) concerns about building an artificial conscience and my rejoinders. Given the increasing importance of artificially intelligent semi- or fully autonomous systems and platforms for contemporary warfare, I conclude that building an artificial conscience is not only possible but also morally required if our autonomous teammates are to collaborate fully with human soldiers on the battlefield.

**Chapter 6 Artificial Intelligence and Ethical Dilemmas  
Involving Privacy**

*James Peltz and Anita C. Street*

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This chapter explores how data-driven methods such as Artificial Intelligence pose real concerns for individual privacy. The current paradigm of collecting data from those using online applications and services is reinforced by significant potential profits that the private sector stands to realize by delivering a broad range of services to users faster and more conveniently. Terms of use and privacy agreements are a common source of confusion, and are written in a way that dulls their impact and dopes most into automatically accepting a certain level of risk in exchange for convenience and “free” access. Third parties, including the government, gain access to these data in numerous ways. If the erosion of individual protections of privacy and the potential dangers this poses to our autonomy and democratic ideals were not alarming enough, the digital surrogate product of “you” that is created from this paradigm might one day freely share thoughts, buying habits, and your pattern of life with whoever owns these data. We use an ethical framework to assess key factors in these issues and discuss some of the dilemmas posed by Artificial Intelligence methods, the current norm of sharing one’s data, and what can be done to remind individuals to value privacy. Will our digital surrogate one day need protections too?

**Chapter 7 Artificial Intelligence and Moral Reasoning:  
Shifting Moral Responsibility in War?**

*Pauline Shanks Kaurin and Casey Thomas Hart*

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How does AI shift the burden of moral responsibility in war? It is no longer merely far-fetched science fiction to think that robots will be the chief combatants, waging wars in place of humans. Or is it? While Artificial Intelligence (AI) has made remarkable strides, tempting us to personify the machines “making decisions” and “choosing targets,” a more careful analysis reveals that even the most sophisticated AI can only be an instrument rather than an agent of war. After establishing the layered existential nature of war, we lay out the prerequisites for being a (moral) agent of war. We then argue that present AI falls short of this bar, and we have strong reason to think this will not change soon. With that in mind, we put forth a second argument against robots as agents: there is a continuum with other clearly nonagential tools of war, like swords and chariots. Lastly, we unpack what this all means: if AI does not add another moral player to the battlefield, how (if at all) should AI change the way we think about war?

## **Chapter 8 Ethical Constraints and Contexts of Artificial Intelligent Systems in National Security, Intelligence, and Defense/Military Operations**

*John R. Shook, Tibor Solymosi and James Giordano*

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Artificially intelligent (AI) systems are being considered for their potential utility and value in a variety of warfare, intelligence, and national security (WINS) settings. In light of this, it is becoming increasingly important to recognize the capabilities, limitations, effects, and need for guidance and governance of different types of AI systems and uses in WINS initiatives.

Most generally, AI systems can be regarded as “soft” or “hard,” although, in reality, these are not wholly binary, but rather exist along a continuum of structural and functional complexity of design and operations. “Soft AI” retains and reveals the fingerprint of responsibility incurred by the human builder and operator. It is programmed and controlled, and at best only semi-autonomous. Here attribution can be placed upon human factors in the design and/or articulation-of-action/event(s) chain. “Hard AI” (e.g., autonomous systems), however, can break that chain, if and when the system moves beyond its initial human-programmed input–output features to evidence “developed/inherent” – and not simply directly derived – characteristics and traits.

Law will likely infer that there is a builder’s bias and basis for any man-made system, and thus could argue that burden of responsibility would rest upon the human enterprise that evidenced the most probable custodianship/stewardship of the feature evoking the action in question.

But this could fail to obtain if and when a system becomes autonomous (e.g., via hierarchical generative encoding). In such an instance, the system could develop novel characteristics as adaptive properties, in some cases in response to and as rejective reaction to certain exogenous (i.e., human) attempts at constraint, imposition, and control.

This result would prompt questions of responsibility, attribution, and considerations of developmental trajectories, possible effects, and regulation and possibilities, viability and definable constraints of use.

This chapter will focus upon these possibilities, and address:

1. Peer capability conferred by AI in asymmetrical engagements.
2. Concepts and content of what constitutes *jus contra bellum*, *jus ad bellum*, and *jus in bello* parameters of AI use in political and military engagements.
3. Effect of AI use on relative threshold(s) and tolerances for warfare.
4. Proposed approaches to risk analysis, mitigation, and operational guidance of AI systems in WINS settings.

## **Chapter 9 An AI Enabled NATO Strategic Vision for Twenty-First-Century Complex Challenges**

*Imre Porkoláb*

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In the twenty-first century, the international defense community has largely struggled with how to organize, strategize, and act effectively in increasingly complex and emergent contexts where the previous distinctions between war and peace have blurred beyond comprehension. Popularly termed “black swan events” continue to shatter any illusion of stability or extension of normalcy in foreign affairs.

Western armed forces as well as intergovernmental military alliances such as NATO appear increasingly unable to deal with these problems using traditional planning and organizing methodologies alone. What had worked well previously no longer appears to possess the same precision and control. The formal operational-level military planning process, initially developed to cope with Cold War Era large-scale military activities in “a conventional, industrialized state vs industrialized state setting” now is seemingly incapable of providing sufficient means of getting the organization unstuck.

Within this new and increasingly complex context, coupled with the increasing tempo of the Fourth Industrial Revolution, NATO has to fulfill all three core tasks at the same time, and in a sense go through a complete digital transformation. It requires new and noble approaches from policymakers, and military personnel alike.

Artificial Intelligence is playing a crucial role during this digital transformation. In this chapter the author will address Artificial Intelligence in future multinational military operations, introduce the most recent political discussions, as well as the research trends and the implications on future warfare for the Alliance.

Specific topics that will be covered include:

- Possibility to use AI in future foresight analysis – better foresight through machine learning.
- Artificial Intelligence and the lessons learned process – how can we transform NATO into a learning organization?
- Capability building – possibilities for using AI and big data analysis to assess capability gaps and improve the defence planning capability system.
- Joint research – cooperation in AI research (Pentagon JAIC, CNAS AI center, and NATO AI research facilities).

## **Chapter 10 AI Ethics: Four Key Considerations for a Globally Secure Future**

*Gina Granados Palmer*

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Harnessing the power and potential of AI continues a centuries-old trajectory of the application of science and knowledge for the benefit of humanity. Such an endeavor has great promise, but also the possibility of creating conflict and

disorder. This chapter draws upon the strengths of the previous chapters to provide readers with a purposeful assessment of the current AI security landscape, concluding with four key considerations for a globally secure future.

**Chapter 11    Epilogue: The Future of Artificial Intelligence  
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*James Canton* *177*

Dr. James Canton, CEO and Chairman of the Institute for Global Futures ([www.GlobalFuturist.com](http://www.GlobalFuturist.com)), will provide a Futuristic view of Artificial Intelligence.

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## About the Editor



**Yvonne R. Masakowski**, PhD, MPhil, MA, has a distinguished career in Psychology and Human Factors spanning over 25 years. She was recently appointed as a Research Fellow by the US Naval War College following her retirement as an Associate Professor of Strategic Leadership and Leader Development in the College of Leadership and Ethics at the US Naval War College. At the Naval War College, Dr. Masakowski focused on the advancement of leader development for the US Navy and the impact of advanced AI technologies on military affairs. Dr. Masakowski currently serves as the US Chair of a NATO panel on *Leader Development for NATO Multinational Military Operations* (NATO HFM RTG 286). She also serves as a dissertation thesis mentor on Artificial Intelligence in the Ethics and Emerging Military Technology (EEMT) graduate certificate program at the US Naval War College. Prior appointments included serving as an Associate Director for Human Factors, Office of Naval Research Global office in London, UK, and as the CNO Science Advisor to the Strategic Studies Group (CNO SSG).

**Dr. Masakowski** earned her Doctorate of Philosophy in Psychology and Master's Degree in Philosophy at The City University of New York. She received a Master's Degree in Psychology (Psycholinguistics) from the University of Connecticut and her Bachelor of Arts in Experimental Psychology from Rutgers University. She earned a diploma from the MIT Seminar XXI program in Foreign Policy and National Security. She has also attended Yale University

where she studied biomedical ethics. She has taught leadership, ethics, cross-cultural competence, and the humanities to graduate students. She has also provided executive leader development to US Navy Admirals and US Navy Attorneys. Her research interests include Artificial Intelligence, decision-making, autonomous systems, leader development, cross-cultural competence, and the Humanities. Dr. Masakowski is the author of numerous publications, articles, as well as book chapters. She has edited a book on Decision Making in Complex Environments, and has written the following book chapters: The Impact of Synthetic Virtual Environments on Combat System Design and Operator Performance in Computing with Instinct; Cultural Competence and Leadership in Multinational Military Operations in Military Psychology from an International Perspective; The Dynamics of NATO Multinational Military Operations Inclusive Leadership Practice in Global and Culturally Diverse Leaders and Leadership; and Leaders and Ethical Leadership in Military and Leadership Development.

**Dr. Masakowski's** leadership and results-oriented philosophy have been recognized nationally and internationally. She has recently been awarded the US Department of Defense *Superior Civilian Service Award* (2019) and the *Lifetime Achievement Award* by the Albert Nelson Marquis Lifetime Achievement Award from the Marquis Who's Who Publications Board. Dr. Masakowski has also been recognized by the Czech Republic and awarded their nation's highest military Medal of Honor, *The Cross of Merit*. She has also been the recipient of awards from France and Poland for her efforts in advancing Science and Technology for military applications.



## About the Contributors

**Keith A. Abney**, MA, is senior lecturer in the Philosophy Department and Research Fellow of the Ethics & Emerging Sciences Group at California Polytechnic State University, San Luis Obispo. His areas of expertise include many aspects of emerging technology ethics and bioethics, especially issues in space ethics and bioethics, robotics, AI and cyberethics, autonomous vehicles, human enhancements, and military technologies. He is a co-editor of *Robot Ethics* (MIT Press) and *Robot Ethics 2.0* (OUP) as well as author/contributor to numerous other books, journal articles, and funded reports.

**James Canton**, PhD, is a global futurist, social scientist, serial entrepreneur, and advisor to corporations and governments. For over 30 years he has been forecasting global trends, risks, and game changing innovations.

He is the CEO of the **Institute for Global Futures**, the Institute for Global Futures, a leading think tank that he founded in 1990. He has advised three White House Administrations and over 100 companies including the US Department of Defence (DoD), National Science Foundation and MIT's Media Lab, Europe on future trends.

Previously, he worked at Apple, and was a US policy advisor, investment banker, and founder of five tech companies. He is the author of *Future Smart*, *The Extreme Future*, and *Technofutures*.

**William D. Casebeer**, PhD, MA, is Senior Director of Human-Machine Systems at Scientific Systems Company, Inc. Bill was the Director of the **Innovation Lab at Beyond Conflict**, and was the Senior Research Area Manager in Human Systems and Autonomy for Lockheed Martin's Advanced Technology Laboratories, where he led technology development programs to boost the ability of humans and autonomous systems to work together. Bill served as a Program Manager at the Defense Advanced Research Projects Agency from 2010–2014 in the Defense Sciences Office and in the Biological Technologies Office. He retired from active Air Force duty as a Lieutenant Colonel and intelligence analyst in August 2011 and is a 1991 graduate of the USAF Academy.

**Thomas C. Choinski**, PhD, **Naval Undersea Warfare Center**, has over 40 years of experience encompassing innovation, management, and engineering that has led to an interdisciplinary approach for technological innovation. Tom has published or presented more than 70 papers in journals or through symposia on

topics including innovation, autonomy, unmanned systems, wargaming, digital signal processing, and microwave design. He holds graduate degrees in business and engineering. Dr. Choinski completed a PhD in humanities (concentration in technology, science, and society), as well as a fellowship through the MIT Seminar XXI Program in National Security Studies.

**Timothy J. Demy**, PhD, ThD, ThM, MSt, MA, is Professor of Military Ethics at the **US Naval War College**, Newport, RI. Previously, he served for 27 years as an officer in the US Navy. He earned the ThM and ThD from Dallas Theological Seminary, and the PhD from Salve Regina University. Additionally, among other degrees, he earned the MA from the Naval War College and the MSt from the University of Cambridge. He is the author and editor of numerous articles, books, and encyclopedias on a variety of historical, ethical, and theological subjects.

**James Giordano**, PhD, is Professor in the Departments of Neurology and Biochemistry, Chief of the Neuroethics Studies Program, Chair of the Subprogram in Military Medical Ethics, and Co-director of the O'Neill-Pellegrino Program in Brain Sciences and Global Law and Policy at Georgetown University Medical Center, Washington, DC.

He currently chairs the Neuroethics Subprogram of the IEEE Brain Initiative; is Research Fellow in Biosecurity, Technology, and Ethics at the US Naval War College; Advisory Fellow of the Defense Operations Cognitive Science section, SMA Branch, Joint Staff, Pentagon; Bioethicist for the Defense Medical Ethics Committee; and is senior appointed member of the Neuroethics, Legal and Social Issues Advisory Panel of the Defense Advanced Research Projects Agency (DARPA). The author of over 300 papers, 7 books, 21 book chapters, and 20 government white papers on brain science, national defense and ethics, in recognition of his achievements he was elected to the European Academy of Science and Arts, and named an Overseas Fellow of the Royal Society of Medicine (UK).

**Casey Thomas Hart**, PhD, is an Ontologist at Cycorp, where he teaches AI what it needs to know to reason about the world. He earned his doctorate in philosophy from the University of Wisconsin-Madison, where he specialized in formal epistemology and the philosophy of science. He lives in Austin, TX. He is inspired by his family: his tireless and wonderful wife Nicole and their two adorable daughters, Juliette and Elizabeth.

**Pauline Shanks Kaurin**, PhD, is a Professor of Military Ethics at the **US Naval War College**, Newport, RI. She earned her doctorate in Philosophy at Temple University and is a specialist in military ethics and Just War theory, the philosophy of law and applied ethics. Recent publications include: *When Less is not-More: Expanding the Combatant/Non-Combatant Distinction*; *With Fear and Trembling: A Qualified Defense of Non-Lethal Weapons* and *Achilles Goes Asymmetrical: The Warrior, Military Ethics and Contemporary Warfare* (Routledge 2014). She served as a Featured Contributor for *The Strategy Bridge*. Her new book on Obedience will be published by US Naval Institute Press in Spring

2020. She has also published with *Clear Defense*, *The Wavell Room*, *Newsweek* and *Just Security*.

**Gina Granados Palmer**, MLA, is a faculty member at the **US Naval War College**, Newport, RI. Ms. Palmer received a Master of Liberal Arts degree in International Relations from Harvard University's Division of Continuing Education and a BS in Mechanical Engineering from California Polytechnic State University, CA. She is currently completing her doctoral dissertation on literary and visual representations of war termination in the Pacific Theater at the end of World War II. She is focusing her doctoral research on leadership, ethics, technology, war and the balance between diplomacy and defense at Salve Regina University, Newport, RI.

**James Peltz**, PhD, is a program manager with the US Government. He is also a graduate of the **US Naval War College**. He has a decade of experience managing government research portfolios in the field of nuclear science, nuclear energy, and nuclear non-proliferation. He has specific experience and scientific expertise in predictive best estimate analysis of engineering systems to include model verification, validation, and uncertainty quantification. James has published several refereed articles and has given several invited presentations on these topics to domestic and international audiences.

**Imre Porkoláb**, PhD, earned his post-graduate degrees at military and civil universities in Hungary and the United States, including Harvard and Stanford. He is a highly decorated military professional with operational tours in Iraq and Afghanistan. He has also played a crucial role in the development of the Hungarian Special Operational Forces (SOF) capabilities. From 2011 he served in the US, at the NATO Allied Command Transformation, as Supreme Allied Commander Transformation (SACT) Representative to the Pentagon. Since 2018, he has been directing the transformation work on the area of the HDF's innovation, and building the national defence industrial base.

He is an expert in guerrilla and counterterrorism warfare, and his research areas include unconventional leadership, change management in a VUCA environment, innovative methods of organizational transformation, and the applicability thereof in the business world. He is an accomplished international speaker, and writer. His first book titled *Szolgálj, hogy vezethess!* was published in 2016; his second book, *A stratégia művészete*, came out in 2019.

**John R. Shook**, PhD, teaches philosophy at Bowie State University in Maryland, and Georgetown University in Washington DC. He also teaches research ethics and science education for the University at Buffalo's online Science and the Public EdM program. He has been a visiting fellow at the Institute for Philosophy and Public Policy at George Mason University in Virginia, and the Center for Neurotechnology Studies of the Potomac Institute for Public Policy in Virginia. At Georgetown University, he works with James Giordano of the Pellegrino Center for Clinical Bioethics. Shook's research encompasses philosophy of science, pragmatism, philosophical psychology, neurophilosophy, social neuroscience,

moral psychology, neuroethics, and science-religion dialogue. He co-edited *Neuroscience, Neurophilosophy, and Pragmatism* (2014), and *American Philosophy and the Brain: Pragmatist Neurophilosophy, Old and New* (2014). His articles have appeared in *Cortex*, *Neuroethics*, *AJOB-Neuroscience*, *Cambridge Quarterly of Health Care Ethics*, *Philosophy*, *Ethics*, and *Humanities in Medicine*, and *Journal of Cognition and Neuroethics*.

**Tibor Solymosi**, PhD, teaches philosophy at Westminster College in New Wilmington, Pennsylvania. He has previously taught at Allegheny College, Bowie State University, Mercyhurst University, and Case Western Reserve University. His research focuses on the consequences of the sciences of life and mind on our self-conception as conscious, free, and morally responsible selves. He is co-editor of *Pragmatist Neurophilosophy* (Bloomsbury), and *Neuroscience, Neurophilosophy and Pragmatism* (Palgrave Macmillan). He is currently working on the intersection of neuroscience and democratic culture, specifically regarding the effects of social media, digital devices, big data, and artificial intelligence.

**Anita C. Street**, MS, is a Technical Advisor with the US Government. She has 30 years experience working in the area of strategic foresight, environmental science, emerging technologies, and national security. She has edited and co-authored a number of publications on nanotechnology and clean water applications, Life Cycle Analysis of emerging technologies, peak phosphorus, and the influence of science fiction on research and development of converging technologies.

## List of Contributors

Keith A. Abney, MA

James Canton, PhD

William D. Casebeer, PhD, MA

Thomas C. Choinski, PhD

Timothy J. Demy, PhD,

ThD, ThM, MSt, MA

James Giordano, PhD, MPhil

Casey Thomas Hart, PhD

Pauline Shanks Kaurin, PhD

Yvonne R. Masakowski, PhD,  
MPhil, MA

Gina Granados Palmer, MLA

James Peltz, PhD

Imre Porkoláb, PhD

John R. Shook, PhD

Tibor Solymosi, PhD

Anita C. Street, MS

California Polytechnic State  
University, USA

Institute for Global Futures, USA

Scientific Systems Company, Inc.,  
USA

Naval Undersea Warfare Center,  
USA

US Naval War College, USA

Georgetown University Medical  
Center, USA

Cycorp, USA

US Naval War College, USA

US Naval War College, USA

US Naval War College, USA

Department of Energy, USA

Hungarian Defence Forces,  
Hungary

University at Buffalo, NY, USA

Westminster College, USA

US Government, USA

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# Preface

*All Warfare is Based on Deception*

–Sun Tzu.

The arms race is on and Artificial Intelligence (AI) is the fast track for twenty-first century global dominance. Nations view AI technologies as a force enabler and the key to achieving global dominance. During the twenty-first century, AI technologies will control information, people, commerce and future warfare. It is our responsibility to be at the helm and shape our future as AI joins the fight.

(Masakowski, 2019)

This book had its origins in hours of discussion between the author and her students, colleagues, fellow scientists, and engineers on the important role of Artificial Intelligence (AI) in shaping the future of society and warfare. The topic of Artificial Intelligence is one that lends itself to lively debate as the technology itself has advanced exponentially, often times being overpromised and under-delivered. Indeed, there is a wide array of perspectives on this topic as some view AI as the great problem solver, while others as a threat to humanity itself. I contend that there is a bit of truth in both perspectives. We are facing an unknown entity in many ways. Foremost among these issues is whether AI technologies will achieve total self-awareness and become a serious threat to humanity. For the moment, we can rest assured that there will be a human-in-the-loop and human-on-the-loop to ensure that AI systems do not present dangers to the human (Porat, Oran-Gilad, Rottem-Hovev, & Silbiger, 2016). However, there are serious considerations regarding the ethical, theological, and moral challenges these technologies present to us during times of war. War itself is debated within the context of Just War theories. So, for this purpose, how will AI technologies influence the rules of engagement and Just War practices of warfare in the future? Should AI systems be designed with ethical rules and algorithms that will constrain its actions and serve as its conscience in future conflicts?

In the course of researching and writing this book, I've discussed these topics with my colleagues and invited them to contribute their expertise and knowledge, as well as speculative theories for future warfare in light of advances in AI technologies. We also need to consider the impact of advanced AI systems

fighting against AI systems in the future? How will AI technologies reset the rules of engagement for future warfare? What are the potential ethical and moral implications of such a future war?

Futurizing warfare is a risky business as we can wargame future concepts however these are often limited by our unique personal experience and knowledge. We need to step out of our comfort zone and imagine a world without ethical and moral boundaries for that is what our adversaries will do. They will not be contained or constrained by such limitations.

This book will address questions related to the influence and impact of Artificial Intelligence technologies being applied across a wide array of crises and domains as well as address the ethical and moral conflicts of war. Among the questions these chapters will explore are: What are the implications of AI for the individual's personal freedom, identity, and privacy rights? What are the consequences of AI advances related to national and global security? Is there a need to develop an AI conscience? What are the potential impacts of AI to AI system warfare? Each chapter will examine the perspectives and consequences for the integration of AI in our daily lives, as well as its influence on society and war. There are considerable consequences for underestimating the potential impacts of AI in warfare. Sun Tzu would have fully appreciated the potential benefits of AI as a tool of deception, as he stated, "The supreme **Art of War** is to subdue the enemy without fighting."

We anticipate that AI will continue to evolve and expand its reach on a global scale. Whatever its course, advances in AI will present challenges and risks for its implementation in daily life, as well as in times of war. It is left to the human to chart a course that will help mankind navigate unknown territory and shape the future world in which we want to live.



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