Conventional Deterrence in the Age of Autonomous Weapons: A Case Study of China and the US

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Supervisor: Dr. Rubina Waseem

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Contents

List of Tables

List of Abbreviations and Acronyms

AI	Artificle Intelligence
AW	Autonomous Weapons
ASW	Anti-submarine warfare
AFRICOM	Africa Command
AUKUS	Australia-United Kingdom-United States
AWS	Autonomous Weapons Systems
BMS	Ballistic Missiles Systems
CDD	Cross-Domain Deterrence
CMC	Central Military Commission
C4ISRT	Command, Control, Computers, Communications, Intelligence, Surveillance, Reconnaissance, and Targeting
CENTCOM	Central Command =
DCD	Desirable Conventional Deterrence
DOD	Department of Defence
EUCOM	European Command
GDP	Gross Domestic Production
INDOPACOM	Indo-Pacific Command
LAWS	Lethal Autonomous Weapon Systems
MCF	Military-Civil Fusion
NDS	National Defense Strategy
NORTHCOM	Northern Command of US
PLA	People's Liberation Army
PLARF	People's Liberation Army Rocket Force
PLAAF	People's Liberation Army Air Force
RMA	Revolution in Military Affairs
SOUTHCOM	Southern Command
QSD	Quadrilateral Security Dialogue
UAV	Unman Arial Vehicle

ABSTRACT

This research study explores how conventional deterrence is changing in the existence of autonomous weapons within modern militaries, through a highlighting lens on the strategic dynamics between China and the US. This study expresses at how the two super-powers substantially investing on AI and autonomous military technologies are changing the deterrence concept and how it influencing their security relations in different regions. The study used a qualitative methodology to examine secondary data from official statements, government official Reports, and academic literature in order to identify developing trends and their possible ramifications. The results of research demonstrate how conventional deterrence frameworks are complicated when these autonomous systems are integrated into military operations, raising the possibility of miscalculation and escalation. The comparison of China's and the US's doctrinal and operational methods, the research offers insights into how each country views its conventional military threats and their resolves in the time of crisis. The study sheds light on how China and the US view and react to these technological advancements by contrasting their doctrinal and operational frameworks within the concept of Revolution in Military Affairs (RMA). This study also emphasizes the crucial role of artificial intelligence and it will help states to forming their future security patterns, which will help us to improve our knowledge of modern Deterrence in a multipolar world.

Keywords: RMA, Autonomous Weapon, AI, Deterrence, Strategic Relation, Escalation

Chapter 1

INTRODUCTION

Deterrence becomes presented in many guises and adapts throughout the years from the older days of nuclear deterrence to the present period's autonomous weaponry. When speaking of national security and the prevention of certain threats, one is quick to think of nuclear weapons as the forefront of military deterrence, however, even such a world with a principle focused on nuclear power had the majority of its military deterrence based on conventional forces. This fact is quite often overlooked as successful prevention does not attract attention. This research study aims to discuss the topic of conventional deterrence and its place in the twenty-first-century security system given the appearance of autonomous weapons. In brief, specific definition of the term can therefore be explained as making someone give up on a certain course of action expecting that the outcome of engaging in that activity will be far much worse than that of not engaging in it. There are many situations in which the phenomenon of deterrence must be discussed and applied, starting with nuclear threat and ending with crime prevention. However, the focus of this discussion is directed mainly towards preventing interstate aggression and similar activities like starting wars, employing armed strikes, and other such activities.

The principle of deterrence does not take a stance concerning using the tool or an instrument used to convey deterrent threats. Modern counter-structural theory was created as a reaction to the advent and dispersion of nuclear weapons;[1] it initially concentrated on these weapons as a means for modern deterrence and as the main threat needing to be deterred. Thus, the term took on the meaning of nuclear strategy, as Wikipedia have chosen to relate policy and deterrence. While today's theorists do not recommend that the term be used exclusively in its narrow application to nuclear deterrence, such terminology is still commonplace in the United States' doctrine regarding issues associated with strategic nuclear assets. Nonetheless, deterrence is actually a much older concept predating the age of nuclear weapons and many states do not even have a nuclear tip of the spear instead relying on non-nuclear means of coercion. However, due to the long-standing historical experience of non-utilization of nuclear weapons, they have become ancillary to some determinate relationships. The field of emerging technologies is characterized by the constant growth of innovations. This evolving environment includes everything from AI, robotics, and

[1] Michael Mazarr, "Understanding Deterrence" (RAND Corporation, 2018), https://www.rand.org/content/dam/rand/pubs/perspectives/PE200/PE295/RAND_PE295.pdf.

drones on one end to quantum computing, 3D printing, and biotech on the other. This very fast pace of change carries the risk of dramatic outcomes that can fundamentally transform the world, as we know it from political leadership to business and economics, the balance of power among leading global players.[2] Thus, in many important technologies, there exists a destructive stewardship by which critical technologies might well remaster the very underpinnings of warfare and reconstruct the cutting-edge of the contemporary combat theater. About these two functions, Abishur Prakash in his book speaks the truth about the fact that contemporary robotics contain the potential to transform the known idea of a deterrent and terms of wars. As he rightly pointed out, "AI and robotics shall disgrace the convention of the present world and the New Technologies shall minimize the disparity of the strategic weightage between the hi-tech militarization and the rest of the world".[3]

While US forces were otherwise engaged in wars in Iraq and Afghanistan, the People's Republic of China engaged itself in a well-planned methodical build-up of the PLA to become an instrument for the modern warfare in the 21st century. This deliberate approach was done with the intention of counterbalancing the previously existing operation advantages of the United States for many years.[4]. Pentagon re-evaluates security threats and risks every now and then, where China was named as one of the pacing challenges The National Defense Strategy recognized the urgent need to strengthen defense and deterrence against Beijing as the rationale of China remaining as the United States' principal strategic rival in the foreseeable future.

In the report: Strategic evaluation and force development of rivals, China is presented as a rival with both intent and growing capabilities to change the strategic order at the macro level in terms of economic, diplomatic, military and technological power. This recognition means a change in the perception of deterrence, and explains why it is crucial to grasp the relations between the US and China beyond nuclear deterrence. Especially, the United States has concern about China's

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[2] Sara Atske, "2. Expert Essays on the Expected Impact of Digital Change by 2035," Pew Research Center: Internet, Science & Tech, June 21, 2023, https://www.pewresearch.org/internet/2023/06/21/expert-essays-on-the-expected-impact-of-digital-change-by-2035/.

[3] Tshilidzi Marwala, "Militarization of AI Has Severe Implications for Global Security and Warfare," United Nations University, July 24, 2023, https://unu.edu/article/militarization-ai-has-severe-implications-global-security-and-warfare.

[4] Al Jazeera Staff, "'Pacing Challenge': US Defence Strategy Focuses on China," www.aljazeera.com, October 27, 2022, https://www.aljazeera.com/news/2022/10/27/pacing-challenge-us-defence-strategy-focuses-on-china.

ability and willingness to alter the structures of the region that has been expressed through Chinese territorial claims in the South China Sea and its longstanding ambition of absorbing Taiwan into the mainland no matter the price of doing so, which would come in the form of the use of force.

1.1 Literature Review

Autonomous weapons systems are emerging due to advancements in unmanned technology and artificial intelligence (AI). The world is about to enter a period of time where not only big powers but also small and medium-sized nations are vying for these technologies, and the ability to employ them successfully will determine who wins in future conflicts. Simultaneously, deterrence and escalation control will be greatly impacted by autonomous *Thinking Machines* since the objects of deterrence will no longer be limited to humans. Assumptions such as 'humans will deter machines; machines will deter humans, and machines will deter each other will have to be made.'[5] Three fundamental conditions must be satisfied for deterrence to work: there has to be the opposite actor; deterrence has to be backed up by a certain capacity (deterrent); and the intent signaling has to be believable. These prerequisites are incredibly washed to accomplish, as evidenced by historical records that demonstrate how deterrence has commonly been unsuccessful.

Due to this, one person finding it extremely hard to understand the other, the overall concept of deterrence is not easy to achieve. In the latter, the other actor appears rational in their approach, but he or she may not be thinking in the same way that you are. The above threats and complexities mean that it is never certain whether the phenomenon of deterrence works or fails as the unity of Rational Actor assumption of state, disparities in strategic cultures, and qualified contextual variations all influence the results. The quintessential concern of acquiring enough deterrent capability and means of conveying intentions goes hand in hand that is very susceptible to change depending on the adversary and circumstances. This means that there are different methods of applying the concept of deterrence and it has to be "tailored" to the other actor and the situation.

But as deterrence is more *specific*, it becomes more difficult to achieve since it rests more on an appreciation of people. Answers to such hard questions, which require years of study, are as follows: What do the opponents most fear?[6] What capacities do they most appreciate? And what signals are needed in order to communicate intentions properly? If these facts are vague the parties

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[5] Junichi Fukuda, "'Complex,' 'Full-Spectrum' and 'Cross-Domain' Deterrence," *Air Power Studies, Air Command and Staff College* 5 (December 5, 2018): 50–53.

[6] Peter Roberts and Andrew Hardie, "Occasional PaPer the ValidiTy of DeTerrence in the TwenTy-FirsT CenTury," August 2015, https://static.rusi.org/201508_op_the_validity_of_deterrence.pdf.

run the risks of crises and escalation as misunderstandings and even simple mathematical errors can cause problems. One cannot know each type of people and this means that it feels hard to try to comprehend them. Several countries are funding research on creating 'smart' machines to be used in warfare with the Chinese leading in this race. The Chinese AI roadmap known as the New Generation Artificial Intelligence Development Plan formulated in July 2017 aims to make the country dominant in, all aspects of theory, technology, and application of AI by the year 2030.[7] Of course, this will encompass the area of national defense, and under the goal set at the 19th Party Congress to "basically" complete the modernization of the military by 2035, China will produce *Thinking machines* for the battlefield. Since the United States published its *Third Offset Strategy* in November 2014 and the military Department publishing its *AI Strategy* in February 2019, the United States has also begun to develop AI for militarize. However, as of now, not one of these countries has strategic, deep-thinking combat machines in place, so the future remains unseen.[8]

Possibly, both countries will have to consider probable skirmishes in East Asia as they frequently employ their 'thinking machines' for following deployment. What risks for the management of the Chinese (Sino-American) and/or 'Taiwanese' conflict, risks for the two countries and their allies and partners – Japan in the first instance – should policy makers contemplate in such a situation? On the same subject, Rand Corporation staged an interesting wargame. The exercise depicted future wars in East Asia wherein the United States, China and other partners such as South Korea and Japan shall employ a strong presence by a large number of *thinking machines* within the field. It happened like this:[9] China said that the area will be submissive to its decisions. In return, the United States launched a cyberattack on a Chinese aircraft carrier, isolating it from the Chinese core AI decision-support system or what is called *'Laoshi'* In practice though since China had not much modernized its aircraft carriers, the efforts carried out by the United States did not make much difference.

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[7] Graham Webster et al., "Full Translation: China's 'New Generation Artificial Intelligence Development Plan' (2017)," DigiChina, August 1, 2017, https://digichina.stanford.edu/work/full-translation-chinas-new-generation-artificial-intelligence-development-plan-2017/

[8] Ahmad Khan, Irteza Imam, and Adeela Azam, "Role of Artificial Intelligence in Defence Strategy: Implications for Global and National Security," May 2021, https://issi.org.pk/wp-content/uploads/2021/05/2_SS_Ahmad-Khan_and_Irteza-Imam_and_Adeela_Azam_No-1_2021.pdf.

[9] David C. Gompert, Astrid Stuth Cevallos, and Cristina L. Garafola, "War with China: Thinking through the Unthinkable," *Www.rand.org*, July 28, 2016, https://www.rand.org/pubs/research_reports/RR1140.html.

Pentagon said the United States and Japan have staged two military exercises simultaneously near the Senkaku Islands to demonstrate their firepower in the region. China only observed these exercises by only monitoring the operations while the deployed vessels' missile systems were programmed to run on complete autopilot.[10]

China utilized a short blockade towards Japan as a measure of war to counter strategy towards the United States and Japan. Its artificial intelligence told one ship to block one Japanese port. The United States was perplexed and believed that the Diet's action did not make much of a difference. The blockade was unsuccessful.

China actuated a more aggressive and asserted itself and began unimpeded sub-surface operations once the blockade did not work. IU and UAV on board Chinese ships were used to block Japanese civil ships from leaving the harbor area. A Japanese cargo ship, left unmanned for the onset of the attack, was capsized.[11]

Therefore, to counter China's embargo, both Japan, as well as the USA started anti-submarine warfare (ASW). In response China shot down unmanned autonomous anti-submarine warfare or ASW aircraft of Japan and the United States.[12] At the same time, a Chinese manned submarine was attacked and sunk by Japan and the United States which finally saw that what China that what they were doing was just unreasonable. The first funerals take place and human death is encountered. This led to China counter attacking both the US and Japanese fleets near the Senkaku Islands resorting to a tactical missile strike. Some of the fleet was destroyed as well as there must have been deaths even though the United States and Japan possesses the missile defense system. China claimed the victory when the United States and Japan pulled out their ships from its missile firing range.[13]

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[10] Ellen Nakashima and Joseph Menn, "China's Cyber Army Is Invading Critical U.S. Services," *Washington Post*, December 11, 2023, https://www.washingtonpost.com/technology/2023/12/11/china-hacking-hawaii-pacific-taiwan-conflict/.

[11] Ellen Nakashima and Joseph Menn, "China's Cyber Army Is Invading Critical U.S. Services," *Washington Post*, December 11, 2023, https://www.washingtonpost.com/technology/2023/12/11/china-hacking-hawaii-pacific-taiwan-conflict/.

[12] Congressional Research Service, "China Naval Modernization: Implications for U.S. Navy Capabilities-Background and Issues for Congress," March 8, 2022, https://sgp.fas.org/crs/row/RL33153.pdf.

[13] Kyle Mizokami, "The U.S. Military 'Failed Miserably' in a Fake Battle over Taiwan," Popular Mechanics, August 2, 2021, https://www.popularmechanics.com/military/a37158827/us-military-failed-miserably-in-taiwan-invasion-wargame/.

This exercise was over, but the United States said it would have contemplated attacking Chinese aircraft just if the exercise was continuing.

For both China and the US., in this tactical level war game ASM was employed as 'thinking machines' and created some occurrence which was unpredictable to both the sides and brought out the end of the constructive deterrence and escalation control phase.[14]

However, there was an increase in some point owed to the divergent estimation between the United States and China over China's blockade and unrestricted submarine operations. China complied with the Al instructions and sought to use one-ship blockage which was not well understood by the United States. Moreover, China's uncontrolled subs' activity did not result in the outcome with human victims as its targets were Unmanned cargo ships and ASW aircrafts. However, this activated the Japanese and the US ASW assets, and the situation became naturalized and culminated in the sinking of Chinese manned submarine. In reply, China counter attacked the Japanese and American forces with utmost aggression, which made the United States, begin to deliberate as to using more force. These achievements stemmed from the fact that there is a low psychological barrier to attack an unmanned object and ambiguous ethical codes of the *thinking machines*. The analysis by the specialist of the Congress Patricia M. Kim in April 2021 states that there is a higher probability of military confrontation between the USA and China since the rivals' strategies have grown. Beijing and the United States have come to understand the growing liabilities of a large power confrontation today, yet they do not lack for quarrels, but they are hard pressed to sort them out agreeably. Thus, to make it possible for the United States and China to compete without negative outcomes being the case, it is now imperative for the two to improve on strategic stability by minimizing the risks of military confrontation particularly that of nuclear; to manage new technologies and new domains of operations, such as space and cyberspace; and also, to avoid a destructive arms race.

Robert P. Haffa Jr. 's research article is a discussion on issues to do with the future controls of conventional deterrence of great powers. It implies that, for the scope of competition with near-peer adversaries as defined in the United States 2018 National Defense Strategy, it is high time that the notions and strategies of the Cold War conventional deterrence were revaluated. Is the

[14] Kyle Mizokami, "The U.S. Military 'Failed Miserably' in a Fake Battle over Taiwan," Popular Mechanics, August 2, 2021, https://www.popularmechanics.com/military/a37158827/us-military-failed-miserably-in-taiwan-invasion-wargame/.

main idea of the concept of deterrence applicable in the context of the new round of the emerging tendencies of QUAD and an increase in the role of great powers in the modern world?[15] These are the questions that give the marital relationship and its outcome from fertility its basic framework. Indeed, there is a future to deterrence, specifically, conventional deterrence. Problems of great power rivalry can be attempted to be solved through modifying conventional deterrence; however, such lays down some specific strategic and force planning implications.

The idea of autonomous weapon deterrence becomes the focus of research of Thomas Christian Bächle and Jascha Bareis in 2022 and it also focuses majorly on the analysis of the Chinese and American cases. Concerning the negative consequences and risks of these technologies and especially their moral, social, and political implications, the political, intellectual and juridical debates multiply with many different stakeholders.[16] Some have advocated for the increased regulation of the product or complete international ban of it.

1.2 Research Gap

While reviewing the literature I developed a clearer understanding of autonomous weapons of US and China, but the idea of its alignment with the concept of revolution in military affairs is not well versed. The gap I found in literature is summed up as the interconnection of autonomous weapon deterrence and the concepts of operational and doctrinal revolution in military affairs (RMA), while keeping in mind the interplay of this particular concept in the strategic thought of US and China. Operational Revolution in weaponry leads towards autonomous weapons that destabilizes the concept of deterrence by increasing the fog of war and uncertainty through more agile and destructive weaponry comprised as thinking machines, however the doctrinal RMA has an antagonistic impact by stabilizing the deterrence by creating clearer command and control system by reducing and eliminating fog of war.

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[15] John Mearsheimer et al., "Conventional Deterrence: An Interview with Clausewitz as Counterpuncher: The Logic of Conventional Deterrence Feature Article Deterrence in the 21st Century: Integrating Nuclear and Conventional Force Expectations of Cyber Deterrence How Does Nuclear Deterrence Differ from Conventional Deterrence? Conventional Deterrence Redux: Avoiding Great Power Conflict in the 21st Century the Future of Conventional Deterrence: Strategies for Great Power Competition," *Strategic Studies Quarterly* 12, no. 4 (2018), https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-12_Issue-4/SSQWinter2018.pdf.

[16] Thomas Christian Bächle and Jascha Bareis, "'Autonomous Weapons' as a Geopolitical Signifier in a National Power Play: Analysing AI Imaginaries in Chinese and US Military Policies," *European Journal of Futures Research* 10, no. 1 (September 2, 2022), https://doi.org/10.1186/s40309-022-00202-w

1.3 Problem Statement

In the context of evolving military technologies, the effectiveness of conventional deterrence strategies between China and the US faces significant challenges with the emergence of autonomous weapons. This study aims to investigate how the integration and deployment of autonomous weapons systems impact the dynamics of conventional deterrence, focusing specifically on strategic interactions and stability between these two major powers. By examining the implications of autonomous weapons on deterrence theory and practice, this research seeks to address critical gaps in understanding the strategic implications and potential risks associated with the intersection of conventional deterrence and autonomous technologies in contemporary geopolitical relations.

1.4 Research Questions

What are the prospects of conventional deterrence of China and US?

1. How did the advent of autonomous weapons impact the debate of conventional deterrence between the USA and China?
2. How has RMA evolved the prospects of conventional deterrence between US and China?

1.5 Hypothesis

Advent of autonomous weapon may destabilize the conventional deterrence between US and China

1.5.1 Variables are:

Independent: Advent of Autonomous Weapon

Dependent: Conventional Deterrence between US and China

1.6 Research Objectives

Assess the current potential of basic strategies of deterrence used by China and the United States. Nonetheless, the results of the traditional deterrence strategies remain inglorious when specializing on the current trends of geopolitical shifts. Study its impact on the discourse of conventional deterrence. Examine how the development of autonomous weapons system changed the concept of strategic stability and military effectiveness. Consider the revolutions in military affairs and their relationship with conventional deterrence between the United States and China.

Pay attention to innovation and escalation in RMA and their impact on military power and strategies as well as deterrence relations in the Sino-American strategic partnership.

1.7 Research Methodology

This qualitative study employs an inductive research methodology, utilizing secondary sources to gather data. The research process begins with an extensive review of existing literature, including books, academic articles, reports, and national security papers. Furthermore, proclamations from government officials are analysed to provide contemporary and authoritative insights into the research. Through combining the information from these different sources, the research aims to uncover patterns, themes, and understandings the subject matter and further room for explorations. The inductive approach in research methodology allows for the development of new theories and concepts grounded in the collected evidence, rather than testing pre-existing hypotheses. This practise ensures a comprehensive understanding of the research topic, enriched by the depth and extent of secondary data. This kind of analysis involves detecting regular themes and constructing a rational narrative that reflects the complications related to the subject.

1.8 Research Significance

Conventional Deterrence in the Age of Autonomous Weapons: A Case Study of China and the US is research needed in the present and with high strategic implications since it articulates present-day questions and the future of conventional deterrence at the intersection of the development of autonomous weapons' technology. The purpose of this study is to: The purpose of this study is to:

1.8.1 Address Contemporary Strategic Dynamics:

Featuring a paying special attention to the USA and China, it explores how the advancements in the sphere of autonomous weaponry modify traditional concepts of deterrence between great powers. Thus, by studying these processes, the research contributes to understanding how particular aspects of military activity and the regulation of international security are evolving in the context of the 21st century.

1.8.2 Explore Strategic Stability Concerns:

The study investigates the potential of autonomous weapon systems on strategic stability given their considerations on crisis, escalation and legitimacy of conventional forces. As for the specificity of modern warfare and the attempts of strategists and politicians to rationalize it, this study appears to be crucial.

1.8.3 Inform Policy and Decision-Making:

The study in the case of this study seeks to play a role in policy discussions of arms control,

military doctrine, and arms control conventions addressing the use of autonomous weapons through offering empirical evidence and theoretical arguments. The goal is to give valuable recommendations that will enable the method enhancement of the deterrence while keeping the dangers associated with the AI self-governance technologies.

1.8.4 Contribute to Academic Scholarship:

The study advances theoretical frameworks in research on technology and deterrence theory, which contributes to the body that consists of literature. It aims at extending the understanding of the effects of technology on military doctrines and strategic actions, which will benefit academic studies in security science and diplomatic science.

In this vein, it would be fair to highlight that a study titled "Conventional Deterrence in the Age of Autonomous Weapons" is equally noteworthy for the given approach as for the timely focus on the essential security challenges that the novel technologies pose and that attempt to develop solutions that meet the criteria of both rigorous scholarly traditions, as well as being useful for political decision-makers and military strategists.

1.9 Organization of Research

The first Chapter of this thesis will focus on the definition of Autonomous weapon and how China and US drafting their national security policies to deter each other. This chapter also explore the real meaning of Autonomy in term of weapons and what will be the future of warfare between rival powers. Most of this research is based on the secondary source of data that includes reports and research articles. This chapter will conclude by apply the deterrence theory on the conventional deterrence between China and US. This chapter also shed light on the concept of Cross Domain deterrence and RMA in modern era military strategies.

The second chapter will then attempt to outline the Defence posture of US and China. It will talk about the policy change and military structure of both states. It will also cover the interplay of conventional Deterrence and hard power of both superpowers. This chapter will conclude by the comparison of conventional power of US and China, and it will find out how conventional deterrence is working in conflicted areas where both states overlap their political and economic interests. Third chapter of the research shed light on the Convectional deterrence in the age of Autonomous weapons systems and what are the prospects of conventional deterrence between US and China. It also discusses the future battel fields and how weaker state will protect their political and economic interests by using the disruptive technologies.

Final chapter of the thesis will present the summary of the study and findings followed by the analysis of the research questions. This chapter will conclude by the verification of the hypothesis and analysis of the research. It will also discuss the deep analysis of research findings and futuristic approaches for further discussion and research.

Chapter 2

CONCEPTUAL AND THEORATICAL FRAMEWORK

2.1 Introduction

In this chapter of the research, some of the approaches has used in defining AWS include various methods of categorization that encapsulates a field of bones of contention regarding the technological nature of systems and the crucial pointers on which specific legal measures depend. While the controversy regarding the chief nature of AWS's predominantly deals with regulatory environments, military appropriations, as well as political and tactical possibilities, the continuous discussion relating to the meaning and scope of AWS's contentious nature continues. We require a general framework of threat responses that they have at their fingertips because we are discussing with autonomous weapons a credible deterrence. These considerations are above engineering dilemmas or philosophical questions; rather, they evoke fictitious domains too. Thus, it is crucial to acknowledge that the right to define the technological meaning is associated and produces both semantic and political power, which states abide by skillfully.

To engender a clearer understanding, three distinct methodologies emerge: First, the importance of the "autonomous" attribute is expressed, which evokes the set of traditional associations reflected in the concept of autonomy. Secondly, attentiveness is paid to the different levels of people's management of automated processes, thus, targeting questions related to human-animated machine relations.[17] Despite the fact that these definitional methodologies share the topological affiliations and interconnections because of which increased autonomy decreases human control, they clearly define two conceptually different paradigms and traditions. The final approach is the most recent, which stresses a primarily functional understanding of AWS, showing and seeking to move beyond the typification, which focuses on the key, defining essential characteristics and properties of AWS.

2.2 Conceptualizing autonomy and AWS

Autonomy and Autonomous Weapon Systems (AWS) have multifaceted definitions in technical terms, where one understanding regards autonomy as a technically definitive and differentiating

[17] Ewart J. de Visser, Richard Pak, and Tyler H. Shaw, "From 'Automation' to 'Autonomy': The Importance of Trust Repair in Human–Machine Interaction," *Ergonomics* 61, no. 10 (April 9, 2018): 1409–27, https://doi.org/10.1080/00140139.2018.1457725.ss

characteristic. “Autonomous” itself indicates this; an “autonomous” weapon system can thereby act on information it independently selects and engage the parameters for which are also independently set to engage a variety of differing targets on its own, whereas automated systems are *triggered*, by contrast, but the selection and engagement of a variety of differing targets is dependent upon situational elements [18].

The larger concept of autonomy carries a diverse set of meanings, from those that appear to be at times contested and implicit to many others that are barely contained and communicated by philosophy, psychology, and human cognition, among several other fields, which range from the anthropocentric to the political to an aesthetic.[19] In AI The definite concept of autonomy in the context of discourse derives and evokes images of independence, intelligence, self-governance, adaptability and the capability for decision making, situational decision making more particularly and also the increasing a number of other factors that are linked with the term ‘autonomy’ with not only in the field of AI technicality but also by philosophically, sociologically, politically and even psychologically at least to some extent.

However, such an application or discussion of the term, as it may be observed in this paper where the focus is on Artificial Intelligence and its problems and ramifications is by no means promiscuous.

Thus, even if the sources of ambiguity are limited to a narrower technical language, they still exist. For example, Bradshaw warns that there is a lingering tendency of equating the bi-valent characteristic of autonomy to machines on one understanding of self-sufficiency which is self-sustaining capacity of an entity and freedom from control on the second. Total liberty does not mean that it is like a machine which is able to take charge itself and at the same time being fully controlled by no one; and being an auto sufficient thing does not necessarily mean that it is free from the control of the second. Thus, the human-machine system, according to such terms, implies a balance between autonomy or self-sufficiency and self-governance or being on one’s own for control; and where no technology is completely independent, the system is strict, such

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[18] James Johnson, “Artificial Intelligence & Future Warfare: Implications for International Security,” *Defense & Security Analysis* 35, no. 2 (April 3, 2019): 147–69, https://doi.org/10.1080/14751798.2019.1600800.

[19] Thomas Christian Bächle and Jascha Bareis, “‘Autonomous Weapons’ as a Geopolitical Signifier in a National Power Play: Analysing AI Imaginaries in Chinese and US Military Policies,” *European Journal of Futures Research* 10, no. 1 (September 2, 2022), https://doi.org/10.1186/s40309-022-00202-w.

speaking a misnomer to say that such a system is *autonomous* at all.[20]

The AWS lies at a nodal point of politico-strategic exchange wherein different deployments of autonomous machines share tendencies towards narratives that are either positive or negative in tone. Thus, AWS is shown to be a key geopolitical theater for state bureaucracies' competition and continuous negotiations over the necessity of clarifying certain definitions; the attempt to agree upon what exactly constitutes an autonomous weapon is viewed as the first stage of forming a future legal regime to govern these technologies.

This kind of semantic battles occurs during the annual/biannual meetings of the experts within the framework of the Certain Conventional Weapons (CCW) Convention, including annexation on the previous amendment.[21] The terminological complexity and the semantic versatility in whose political consequences my investigations on the political implications of terminology and semantic shifts are concentrated have sparked an internecine defenestration race in the CCW regarding the meaning of the term "autonomy" in the lack of proper measures regulating AWS in the political process. Thus paradoxically, as Williams has written about, yet another jointly used terminology, *terms obscure the matter*, even if the terms seem to be very specific, that specific terms meet with polysemy and are used metaphorically. The metaphoric meaning and the opaqueness of the term "autonomy" in combination with the military robots become problematic when these machines are *enveloped in the veil of military security and intelligence*. Thus, only a sophisticated understanding of human decision-making throughout the process of designing and manufacturing the CACs can appear sufficient. Production, and programming of autonomous machines can resolve arguments over agency and (legal) responsibility for their actions.[22]

Attempting to outline AWS simply by referring to the concept of autonomy leads to lack of sufficient definitions, mainly because using the adjective 'autonomous' as the main criterion results in rather ambiguous basic categorization, as it encompasses a wide range of associated meanings. For instance, the term *technical autonomy* is, by itself, suggestive of a gradient, as

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[20] W. F. Lawless and Donald A. Sofge, "Evaluations: Autonomy and Artificial Intelligence: A Threat or Savior?," *Autonomy and Artificial Intelligence: A Threat or Savior?*, 2017, 295–316, https://doi.org/10.1007/978-3-319-59719-5_13.
[21] UN, "The Convention on Certain Conventional Weapons – UNODA," United Nations, n.d., https://disarmament.unoda.org/the-convention-on-certain-conventional-weapons/.
[22] Artur KUPTEL, "'AUTONOMISATION' of SECURITY and DEFENCE SYSTEMS," *Security and Defence Quarterly* 23, no. 1 (March 28, 2019): 79–96, https://doi.org/10.35467/sdq/105430.

was demonstrated when semiotic terminology like *Semi-Technical* or *Semi-Autonomous* had to be tacked on. It is the same with the term ‘Autonomous.[23] Even if its definition entails precise declassification in technological terms and, thus, supposedly yields AWS capabilities, which are unambiguous, the term is far from providing These findings demanded that AWS have to be presented in diverse contexts because its multifaceted nature requires contextual understanding.

2.3 Functionality paradox of autonomous weapons

The lack of precise terminology surrounding Autonomous Weapon Systems (AWS) has prompted recent efforts to establish a functional definition. However, as we shall illustrate, these task-specific methodologies amalgamate and reconfigure previously discussed conceptual and relational frameworks, thereby giving rise to their own set of challenges, notwithstanding their aim to delineate actual functionalities in practical contexts.

Currently, the prevailing approach toward achieving a functional understanding of autonomous weapons centers on a task-based analysis focusing on the activities of *selecting and engaging* targets. This method recontextualizes earlier definitions while placing greater emphasis on the constituent elements and implications of these functions within specific operational environments. Notably, the United States Department of Defense (DoD) defines an AWS as a "weapon system that, once activated, can select and engage targets without further intervention by a human operator."[24] This encompasses systems that permit human supervision but possess the capability to autonomously select and engage targets post-activation. This approach is gaining momentum and political acknowledgment.

Conversely, the International Committee of the Red Cross characterizes AWS as any weapon system with autonomy in the critical functions of target selection and target engagement. In essence, such systems possess the capacity to detect, identify, and attack targets without human intervention. [25]Commentators stress the importance of adopting definitions akin to that of the ICRC and advocate for a concerted international response to the continued development of these

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[23] Christof Heyns, “Human Rights and the Use of Autonomous Weapons Systems (AWS) during Domestic Law Enforcement,” *Human Rights Quarterly* 38, no. 2 (2016): 350–78, https://www.jstor.org/stable/24738054.

[24]CEBRI Revista, “Exploring the 2023 U.S. Directive on Autonomy in Weapon Systems,” CEBRI Revista, September 2023, https://cebri.org/revista/en/artigo/114/exploring-the-2023-us-directive-on-autonomy-in-weapon-systems.

[25] Paul Scharre and Michael C. Horowitz, “Autonomy in Weapon Systems,” *Center for a New American Security*, February 2015, http://www.jstor.com/stable/resrep06106.s

weapons.[26]

The main focus within this definition can be said to revolve around two parameters, namely the target and the attack and the level of automation or the lack of it in as much as human interjection is concerned. While target identification – which may include the aspect of distinction, whether it is between combatants and non-combatants or in other phases of planning, and the notion of attack, which gives rise to questions about the demarcation of individual attacks, as well as the temporal scope of each, contain contradictions, albeit less evident.

To positively seek a definition that brings more clarity, distinguishing AWS from preceding weapon systems with a view to encompassing certain working definitions of SAS, one is quickly struck by the problem faced by mainstream working definitions of AWS that presents a list of tasks performed independently by AWS: to wit, it tries to overlay a clear and distinct generic distinction on AWS that fails in terms of establishing a satisfactory cutting edge and at the same time, does not meet the requirement of. It is still important to recognize that, to this day, both autonomy and meaningful human control are rather more of floating terms. Likewise, those tasks that are associated with the functioning of autonomous weapons are coded into military approaches, structures, and certain contexts, which, in the last analysis, define the ontological realities as well as varying degrees of autonomy.[27] In other words, the contextual settings create the context that defines the functioning of autonomous weapons' agency.

The anticipation that a pragmatic, task-centered definition of Autonomous Weapon Systems (AWS), notably focusing on target selection and engagement, would resolve the ambiguity dilemma is likely to be unfounded. Even with more precise terminology, political discourses subject these definitions to deliberate manipulation, wherein various actors employ divergent meanings, interpretations, and definitions to advance specific political and geostrategic agendas. This complexity is compounded by voices from non-political spheres, contending that current AWS technologies lack the sophistication necessary to draw reasonable conclusions regarding

[26] Michael Skerker, Duncan Purves, and Ryan Jenkins, "Autonomous Weapons Systems and the Moral Equality of Combatants," *Ethics and Information Technology*, February 23, 2020, https://doi.org/10.1007/s10676-020-09528-0.
[27] Weronika Alexandra, Perlinski Supervisor, and Jan Bachmann, "Autonomous Weapons -the 'Kalashnikovs' of Tomorrow?," 2017, https://gupea.ub.gu.se/bitstream/handle/2077/55346/gupea_2077_55346_1.pdf?sequence=1.

their practical, legal, or ethical ramifications.[28]

Both conceptual and task-oriented approaches engender semantic recursions, as the imperative to establish a static meaning for these terms remains unattainable across all levels of theoretical abstraction. An often-overlooked issue in these debates is the challenge of translating these terms across languages entrenched in vastly distinct terminological and conceptual frameworks. These cultural disparities manifest in broader imaginaries that foster specific expectations, aspirations, and apprehensions surrounding new technologies.[29] These cultural narratives are perpetuated not only through fictional literature but also through public discourse. In the case of AWS, the descriptor "lethal" is illustrative. By appending the letter *L in LAWS*, the term underscores the alignment of these technologies with the archetype of *killer robots*, invoking culturally specific imagery. These portrayals foreground the perceived dangers associated with autonomous weapons beyond human control, fueling apprehensions of imminent humanity-threatening devastation. Subsequent sections of this discourse will specifically delve into the role of broader sociotechnical imaginaries in shaping and defining the significance of AWS technologies.[30]

2.4 US-China Strategic interplay of Autonomous Weapon System

Despite that Advocates and advocacy groups, backed by a lot of countries and Nobel Peace Prize laureates also demanded a ban on lethal autonomous weapon systems through an international treaty. Firstly, when the base platform consisted of novel solutions and global relations were not anywhere near as complicated as they are today, it was possible to seemingly reach this goal. Nevertheless, this perspective has changed. Currently, the political debate has evolved to the idea of actively having to develop ways of controlling these systems, instead of attempting to slow down their development. Being military forces of two countries that are military adversaries of each other, the United States and Great Britain are both find projects to

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[28] Mariarosaria Taddeo and Alexander Blanchard, "A Comparative Analysis of the Definitions of Autonomous Weapons Systems," *Science and Engineering Ethics* 28, no. 5 (August 23, 2022), https://doi.org/10.1007/s11948-022-00392-3.

[29] William H. Boothby, *Weapons and the Law of Armed Conflict*, *Google Books* (Oxford University Press, 2016), https://books.google.com.pk/books?hl=en&lr=&id=9qJHDAAAQBAJ&oi=fnd&pg=PP1&ots=O2RnSjN95R&sig=u4k2ITs2ctFvJmaEQA0uOFVIKB8&redir_esc=y#v=onepage&q&f=false.

[30] Vincent Boulanin, "Limits on Autonomy in Weapon Systems: Identifying Practical Elements of Human Control," Policycommons.net (Stockholm International Peace Research Institute, June 2020), https://policycommons.net/artifacts/1719541/limits-on-autonomy-in-weapon-systems/2451279/.

create *swarms* of small drones that can combine to work with each other with the help of AI systems.[31] It is believed that out of these swarms, which are expected to be fired from planes and naval vessels, the basics are to bomb an area of a target country and create confusion before introducing the main soldiers. In 2017 the Pentagon desired proposals on how to launch many quadcopters through missile so that they could be released over determined targets and the small drones would then seek out and knock out enemy facilities on their own accord.[32]

Furthermore, the U. S military has not left behind and has applied the use of AI algorithm in flying simulators with deep learning. Through these tests, it has been demonstrated that in complicated aerial interactions AI is as good, if not better than a human pilot. The United States maintains that the moment AI-controlled planes become tactically feasible for use, they will merely act as back-up to people's pilots. Robotics, machine learning, and visual recognition techniques have made significant strides that have improved computers' capacity to navigate complex surroundings. The war in Ukraine has provided combat data and contributed to an increase in funding for organizations that offer protective technologies at various levels of development.[33] In addition, the increase in hostility across the world exposes a world society, which is in the process of being less cosmopolitan or simply unwilling in holding itself to the account of humanitarian obligation. At the same time, the US has advanced the timeline for when it will put intelligent weapons into the field.

The next day, the US Deputy Secretary of military, Kathleen Hicks, speeches at the military industry conference in Washington, DC focusing on technology around late August 2023. The topic of her lecture, which was: *the urgency to innovate* might not have sounded menacing at all, but what she was in fact talking about was nothing less than a revolution in warfare as a phenomenon characteristic of the post-modern world. On the question by the analyst on the number of attainable autonomous systems applicable in diverse fields on a large scale, Hicks said the plan is to have thousands in the next 18-24 months.[34]

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[31] Congressional Research Service, "Renewed Great Power Competition: Implications for Defense-Issues for Congress," February 28, 2024, https://sgp.fas.org/crs/natsec/R43838.pdf.
[32] David Hambling, "US Army Wants to Fire Swarm of Weaponised Drones from a Missile," New Scientist, January 18, 2017, https://www.newscientist.com/article/2118412-us-army-wants-to-fire-swarm-of-weaponised-drones-from-a-missile/.
[33]sAdib Bin Rashid et al., "Artificial Intelligence in the Military: An Overview of the Capabilities, Applications, and Challenges," *International Journal of Intelligent Systems* 2023 (November 6, 2023): 1–31, https://doi.org/10.1155/2023/8676366.
[34] Jamie Bennet, "Deputy Defense Secretary Kathleen Hicks: Innovation Is in America's DNA,"

In the innovation of military technology, an autonomous system of early warning drones is now in the Persian Gulf, accomplished by a specialized task force within the US navy solely for the development of artificial intelligence. As the Strait of Hormuz is one of the SOCFs most critical chokepoints in terms of the distribution of the world's energy resources, observing the openness of similar waters for navigation is strategically important. These talents, nevertheless, are advancing into an area beyond mere awareness of respective domains. To be more precise, on October 23, 2023, an unmanned US Navy combat ship distinguished an adversary goal with real ammunition for the first time without the employment of human directors. This was done so as to meet the need of a land-based operator through issuance of an order.

As per the records found, the Pentagon is now in the process of developing over 800 military AI projects where the majority of them are focused on the enhancement of threat recognition, combat decisions, and operational organization.[35] However, this synopsis is limited to the information which can be obtained with the help of open channels and information in the decremental records. Autonomous weapons may not be created or tested secretly like nuclear weapons are created or are tested. Moreover, the Ukrainian conflict has demonstrated the relevance of mass in today's warfare strengthening the argument for cheap intelligent ammunition like drones.

Indeed, it appears the United States is investing a lot of effort in training for potential confrontations against an assertive China. Beijing is equally aggressively seeking out autonomous weaponry technologies even as, according to stated policy, it is merging the military and the civilian spheres. Seriatim, the US-China Economic and Security Review Commission, a congressional body, recognizes in a part of its 2023 annual report that, according to investment and procurement, the PLA is advocating for AI-enabled weaponry to target and capitalize on the strengths of the United States and, at the same time, exploit its weaknesses.[36]

Lethal autonomous weapons arguably pose the greatest medium-term risk in this context: Hitherto, a major accident of the US military, the PLA or any protected ally – be it Taiwan,

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Executive Gov, May 10, 2023, https://executivegov.com/2023/05/kathleen-hicks-innovation-is-americas-dna/.

[35] Frank Bajak, "Pentagon's AI Initiatives Accelerate Hard Decisions on Lethal Autonomous Weapons," AP News, November 25, 2023, https://apnews.com/article/us-military-ai-projects-0773b4937801e7a0573f44b57a9a5942.

[36] Rishi Iyengar, "What America's Top China Commission Is Worried About," Foreign Policy, July 24, 2024, https://foreignpolicy.com/2023/11/14/biden-xi-meeting-apec-uscc-china-report/.

South China Sea – could create an unwanted global turmoil for all the competing parties. Cognizant, countries such as Australia are aspiring to develop and purchase unmanned systems in the future as India and South Korea are presently doing.[37]

There is no articulate de-escalation plan laid down in the use of deadly autonomous weapons and therefore such an event could easily go out of proportion regardless of whether it was as a result of a defective technology, or a mistake done by a human being. In such a situation, the two nuclear weapons' country of the United States and China and two countries emerged in competition confrontation which will impact the peace of the international system and their allices in the region.

A small but important step forward is the recent agreement reached by US President Joe Biden and Chinese President Xi Jinping to hold bilateral talks about the hazards involved with using AI systems in military applications. The two presidents' decision to restore bilateral emergency communication channels inside their respective military forces is far more important. China has cut off these direct channels of contact when House Speaker Nancy Pelosi visited Taiwan in August 2022, an event that infuriated Beijing.[38] Although the continued use of these channels is not certain, their reactivation ought to operate as a cornerstone upon which to collaboratively develop a targeted and sequential de-escalation protocol.

The systems that are already in place to allow military commanders to step back might be crucial in reducing tensions that arise from isolated events or lowering the likelihood of military mobilization. Despite assertions from proponents of lethal autonomous weapons that their deployment would adhere to legal norms and be less sensationalized compared to the dystopian portrayals presented by activists, there is widespread agreement that these weapon systems would significantly expedite the pace of warfare. Their capacity for rapid, targeted strikes would narrow the timeframe available for deliberating retaliatory measures, increasing the likelihood of minor incidents escalating into large-scale conflicts.

This situation would be made worse if models with humans on the loop factors, where human intervention is only minimal, are promoted over humans in the loop models. As opposed to the

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[37] Kanaka Rajan, Shayne Longpre, and Ryan Badman, "AI-Powered Autonomous Weapons Risk Geopolitical Instability and Threaten AI Research," arxiv.org, 2024, https://arxiv.org/html/2405.01859v1.

[38] Sydney J. Freedberg Jr, "Biden Launches AI 'Risk and Safety' Talks with China. Is Nuclear C2 a Likely Focus?," Breaking Defense, November 16, 2023, https://breakingdefense.com/2023/11/biden-launches-ai-risk-and-safety-talks-with-china-is-nuclear-c2-a-likely-focus/.

fully autonomous design which has a commanding human overseer who can choose to oversee or interject in a robot's actions if needed, the units are programmed to detect and attack targets on their own through a set of issued algorithms. The US government may argue that these weapon systems still meet its standards in having oversight by human beings in different aspects of the weapons. Military AI applications.

2.5 Conventional Deterrence Theory

Intimidation is a crucial theme in International Relations and Security Studies hence deriving the ability to control other people's actions using the threat of force against the enemy. It is to create a sense of fear of implications in the potential aggressors to discourage them from behaviors or to make such behavior's utility outweigh itself to zero.[39] In the case of the US, deterrence that was earlier used for military power has now expanded to economic pressure, diplomatic pressure, and even information warfare. Indeed, the 21st Century type of conventional and nuclear threats in the different domains of security calls for issues concerning the changes in the theory of deterrence particularly with the question on self-developing weapons on the table. This chapter is concerned with the history and theory of conventional deterrence, a concept that has occupied theorists' minds for the last one hundred years. One of them divides conventional deterrence measures into four subsystems by the geographical coverage and the nature of the threat, paying much attention to the question of the battle resistance to invaders on the territory. The last section of the chapter now examines the concept of strengths and weaknesses of conventional and nuclear deterrence and identifies a few principles on conventional deterrence for the strategist.[40] This act usually encompasses a variety of aspects, which are usually associated with nuclear threats, however, the majority of military deterrence is underpinned by conventional methods, which, on their turn, go unknown since they are subtle. This chapter focuses on conventional abhorrent and its place within the first half of the twenty-first century. Therefore, according to the deterrent theory of punishment, deterrence implies that specific action is discouraged due to the seemingly adverse consequences as compared to inaction. Although there are many types of deterrence this chapter is devoted to automated interstate aggression and RMA conception including war initiation, military attacks, and conflict escalation. The term *Desirable Conventional Deterrence* became popular in 1980's mainly

[39] Bjørn Møller, "The Concept of Security: The Pros and Cons of Expansion and Contraction," ciaotest.cc.columbia.edu, August 2000, https://ciaotest.cc.columbia.edu/wps/mob01/.
[40] Karl Mueller, "The Continuing Relevance of Conventional Deterrence," *NL ARMS*, December 4, 2020, 47–63, https://doi.org/10.1007/978-94-6265-419-8_4.

stemming from John Mearsheimer.[41] This means that the traditional type of deterrence is not the same as the nuclear deterrence type but is related to it. Instead of using this definition to conceptualize it as any other type of deterrence that is not nuclear, this paper more specifically confines it to encompass only threats made using conventional armed forces in warfare. This means conflict or battlefront resistance, retaliative military operations against far targets, and guerrilla warfare in occupied territories but the total military-related actions besides economic boycotts and non-violent political pressure and actions that are taken after the war is over. Conventional within this framework, several sub-categories of deterring exist Though there are clearly distinct sub-divisions between them, in practice there is much overlap.

Another subfield within the Deterrence theory that has so far been comprehensively developed in the contemporary discourse is Cross-Domain Deterrence (CDD), which deals with the possibility of applying deterrence in several domains. Cross Domain Deterrence (CDD) can be explained as the process of applying threats of one form or another to an opponent to prevent him or her from taking certain actions that will change the existing equilibrium. The major feature of CDD is a high level of technological component used for the political effects oriented to the deterrence.[42]

This is so because, with the availability of more force/coercion instruments and warfare programs, even the States with less raw power types can face those of more powerful types. They include North Korea and Iran, in the use of cyber weapons and information spying. This is made even more complicated by the emergence of new conflict fields including cyber and space domains. On the same account, other factors include China's peaceful rise and its military build-up, geometric power relations in the pacific, and Russia's aggression in Estonia Georgia and Ukraine. The integration of Iraqi (2003) and Afghan (2001) affairs by American interests alongside the problem areas addressing Iranian and North Korean nuclear threats add up to that too.

CDD has transitioned through various phases, namely phase one, also referred to as the first offset, centered on nuclear policies, phase two or the second offset, emphasizing on emerging sophisticated machinery and weaponry; and phase three or the third offset of focusing on other

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[41] Strategic Studies Quarterly, "Conventional Deterrence: An Interview with John J. Mearsheimer," July 18, 2018, https://www.mearsheimer.com/wp-content/uploads/2019/03/Convential_Deterence.pdf.
[42] Tim Sweijs and Samuel Zilincik, "The Essence of Cross-Domain Deterrence," *NL ARMS*, December 4, 2020, 129–58, https://doi.org/10.1007/978-94-6265-419-8_8.

technologies, for instance, AI and quantum computing. Modern globalization also increases various concerns associated with CDD in the 21st century. ‘‘Critical infrastructures’’ that are in space as well as in cyberspace are the other aspects which have become more significant over time yet they present deterrence prospects as well as complexities.[43] With the emergence of new forms of warfare like cyber warfare, and space-based weapons combined with their application in the civilian domain, traditional deterrence structures and theories offer fumbling frameworks, thus; various political actors in today’s global structure, ranging from rising powers such as China, regional challengers like Russia and Iran up to non-state actors are subverting the warfare technologies of the US and other predominant powers. On the other hand, the powerful states are also applying those capabilities for the assertion of their interests.

While historical coercive strategies have typically involved naval and ground forces, the emergence of threats to Autonomous weapons, space and cyber infrastructures complicates contemporary deterrence efforts for policymakers and strategists. Additionally, non-military tools like economic sanctions and demographic movements, coupled with the growing influence of non-state actors in global affairs, further add layers of complexity to strategic calculations.

In this research the concept of RMA shed light on the induction of Autonomous weapons in modern military strategy. Furthermore, the decisive victories of the United States in the Iraq War (2003) and Afghanistan War (2001) are often cited as prime examples of the Revolution in Military Affairs (RMA) and its transformative impact on warfare. Since the 1991 Gulf War, military analysts have argued that warfare is undergoing a fundamental change.[44]

RMA and *advanced transformation* are the translation of the transition from mass, slow and massive forces to light, maneuverable and informational, particularly IT ones. The U. S. military’s strategic plan in utilizing warfare is that of network-centric warfare that include development of C4ISRT (Command, Control, Computers, Communications, Intelligence, Surveillance, Reconnaissance, and Targeting). Many analysts are in a mutual consensus that improvement of ICTs is behind this military revolution.[45] Previous literature focused on this

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[43] Syed Ali Hadi, “Cross Domain Deterrence – a Critical Appraisal,” Centre for Strategic and Contemporary Research, March 6, 2020, https://cscr.pk/explore/themes/defense-security/cross-domain-deterrence-a-critical-appraisal/.

[44]Tsukamoto Katsuya, “The Gulf War as a Harbinger of a Revolution in Military Affairs (RMA) Tsukamoto Katsuya,” 2021, https://www.nids.mod.go.jp/event/proceedings/forum/pdf/2021/EN_06_tsukamoto.pdf.

[45]Zalmay Khalilzad, John White, and Andrew Rand, “STRATEGIC APPRAISAL DISTRIBUTION

topic, primarily from the United States, stress the incorporation of new technology, innovativeness, military culture and doctrine.

In the international context apart from the US and the western world there is new literature which has concentrated on change issues such as technology, financial considerations, and culture in the military. Nonetheless, there is hardly any debate on the positioning of RMA within a strategic framework. Based on the gradual globalization of transformational technologies especially those originating from Asia, such analysis of strategic implications cannot be overemphasized. This includes knowledge of the effects of these transformations on warfare approaches and state's defense, as well the stability of the state-centered deterrence strategies for their security.

The objective of this paper is to theoretically model how AI-enabled transformation affects conventional deterrence and assess if deterrence theory will have a utility if states with RMA equipped armed forces confront others in conventional wars.

Despite the speculations of military scholars where some of them are of the view that what is going on within RMA is a revolution in military affairs, others indicating it as an evolution only, it cannot be doubted that technology is perhaps the most influential way of altering contemporary war. In this paper, only the prospects of AI are under consideration, excluding emerging. Thus, there is an emerging recognition that change is an ongoing process based on doctrinal and organizational shifts, as well as quality training, human resources management, defense management, efficient procurement and smarter buying, and a high-technology force backed up by first-rate logistics support. In the context of this research, RMA and transformation are used as synonyms and it is postulated that militaries designed for RMA are most appropriate for fighting high-intensity conventional wars and are not very effective against non-conventional foes.

In analyzing the impact of Lethal Autonomous Weapon Systems (LAWS) on future warfare deterrence, two key factors are crucial: the reliability in the weapon systems' deadly nature and the ability to convey this deadliness to the enemy. This paper focuses on identifying four possible application cases of deterrence with relation to LAWS in a naval blockade context.

STATEMENT a Approved for Public Release Distribution Unlimited Information in Warfare Edited By," 1999, https://apps.dtic.mil/sti/tr/pdf/ADA364003.pdf.

2.5.1 **Tripwire Deterrence:**

The defending nation uses LAWS automatically in the event of a naval embargo to inform the attacker that any provocative move past a set line will attract an automatic strike. Here, both parties comprehend the division and the LAWS's reaction, reducing ambiguity. The involvement of man is minimal, and thus, there is less volatility that arises out of what people may or may not do, given certain circumstances, thereby providing stability in deterrence very much like a defensive tripwire that Schelling postulated.[46]

2.5.2 **Tripwire Bluff:**

The defender also announces the certain death that a society will receive with LAWS, but this certainty is not real. The LAWS could be proved invalid or will on average give disparate outcomes. The defender feigns a tripwire defense and makes the enemy think that there is a strong defense but in the real sense there is no stand.

2.5.3 **Single-Side Uncertainty:**

The defender's LAWS are deadly, as can be expected from the nature of this type of system, but the capability is not presented to the aggressor in a clear enough manner. The former experiences significant doubts concerning the efficiency of the blockade and has to make the decision while hesitating about the defender's capacity.[47]

Of these scenarios, Tripwire Deterrence is the most stable because both sides have relatively low levels of private information about each other and because LAWS' capabilities are well understood. At the same time, Tripwire Bluff's stability remains intact if the adversary does not expose the receiver's deception. Brinkmanship Deterrence is unstable because the LAWS remain in a developing stage, and there could be inadequate data for the machines' functioning. LAWS could eventually switch to Single-Side Uncertainty as the data collected and testing is carried out; the defender is certain of the system reliability, whereas the adversary is not. However, should the adversary eventually validate the LAWS's capability, the situation may further transform into consequent Tripwire Deterrence.

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[46] Dan Reiter and Paul Poast, "The Truth about Tripwires: Why Small Force Deployments Do Not Deter Aggression," Texas National Security Review, June 2, 2021, https://tnsr.org/2021/06/the-truth-about-tripwires-why-small-force-deployments-do-not-deter-aggression/.

[47] Dan Reiter and Paul Poast, "The Truth about Tripwires: Why Small Force Deployments Do Not Deter Aggression," Texas National Security Review, June 2, 2021, https://tnsr.org/2021/06/the-truth-about-tripwires-why-small-force-deployments-do-not-deter-aggression/.

2.6 Conclusion

The concept of deterrence has been evolving in the past few decades and states are very much optimistic to adopt new conventional deterrence theory with the advent of autonomous weapons. Another subfield within the Deterrence theory that has so far been comprehensively developed in the contemporary discourse is Cross-Domain Deterrence (CDD), which deals with the possibility of applying deterrence in several domains. Cross Domain Deterrence (CDD) can be explained as the process of applying threats of one form or another to an opponent to prevent him or her from taking certain actions that will change the existing equilibrium. The major feature of CDD is a high level of technological component used for the political effects oriented to the deterrence, based on the gradual globalization of transformational technologies especially those originating from Asia, such analysis of strategic implications cannot be overemphasized. This includes knowledge of the effects of these transformations on warfare approaches and state's defense, as well the stability of the state-centered deterrence strategies for their security. In the contemporary security environment, the unconventional threats are more visible and threatening instead of conventional ones, that's why states are highly investing in their conventional capabilities. In terms of autonomous weapon and deterrence theory structure, both the US and China are quite capable of attaining their political and economic interests in many parts of the world. Interplay between the US and China in the South China sea is quite interesting for the political and defense analyst, because both states are deterring each other in the presence of autonomous weapons at their resolution.

Chapter 3

PROSPECTS OF CONVENTIONAL DETERRENCE: CASE STUDY OF US AND CHINA

3.1 Introduction

The rise of China's military and economy is changing the geopolitics of the world. The conflict between China's growing influence and US reluctance to embrace it is present in every region. These forces are most rapidly and dangerously rising in East Asia, particularly in the politically sensitive areas of China, Taiwan, and the US. Because of China's determination to expand its influence, the US's desire to preserve its own, Taiwan's unique history, aspirations on the world stage, and economic significance, the island's status is a very delicate subject. Differences over Taiwan and China's unification, as well as growing competition between the US and China, are putting strain on this three-way relationship. For the present work, it is necessary to identify postures that would prevent a cross-Strait confrontation and meet the criteria of deterring the Chinese military against Taiwan, correspond to U. S. capabilities and interests, and consider the key aspect of nonnuclear deterrence. The modern American outlook still regards the threat to employ nuclear weapons during a crisis as a usable option or regaining Taiwan’s conventional superiority as feasible solutions. Further, the US has not invested enough to defend from likely Chinese cyber warfare, military and economical aggression. Therefore, the United States, as a result of the rising potential of conflict in the Western Pacific, is quickly redesigning its approaches to military affairs. China’s rather swift build-up of its armed forces and especially its A2/AD has challenged the previously hegemonic American propensity to assert itself into the First Island chain in response to intimidation. Consequently, the Pentagon is devising a strategy on how to replicate actions similar to Beijing’s A2/AD umbrella and deny admission to hostile forces in the Western Pacific.[48]

Many defense analysts have advocated for this particular strategic change for quite some time with some noting that given China’s massive capacity, this move is compulsory. This exists for the advantage of the US and its allies since it capitalizes on the geographical conditions of the area and the challenges that arise with applying force. The necessity of such transition is evidenced by the numerous statements from both American politicians and military notable

[48] Fabian-Lucas Romero Meraner, “China’s Anti-Access/Area-Denial Strategy,” TDHJ.org, February 9, 2023, https://tdhj.org/blog/post/china-a2ad-strategy/.

warning that conflicts in the Strait might occur over this decade even though they do not consider it inevitable. This critical demand implies the synchronization of actions of the United States of America armed services and partners to implement the new plan within a specific timeframe.

This tactic, known as *anti-access with American characteristics,* however, comes with six important trade-offs that the Pentagon and American civilian officials need to weigh carefully. Given the urgency and shortening timescale, many of these difficulties necessitate collaboration with U.S. friends and partners; yet these talks are not as far as they ought to be. Making tough decisions is a necessary part of strategy, and the United States is only now starting to face the challenges that come with its new direction.

3.2 Overview of U.S Conventional Military Capabilities

As a major world power, the United States has a wide range of foreign interests, which makes it necessary for the military to be prepared to defend the nation and protect national interests everywhere. With its many allies, reliance on international trade, and ongoing threats from powerful rivals looking to erode its influence in strategic areas, the United States cannot afford to focus on any one region or particular threat. Thus, in order to safeguard the freedom to utilize the global commons sea, air, space, and cyberspace that are essential to American economy and political influence, the U.S. military has to be suitably big, armed, and ready.

But as earlier iterations of the Index of U.S. Military Strength have made clear, the U.S. military is not adequately equipped to carry out its duties and is incapable of managing several Major Regional Contingencies (MRCs). Over the last two to three years, things have become worse.[49]

The United States encounters increasing obstacles from significant rivals like China and Russia, in addition to the destabilizing influence of terrorist and rebel factions in critical areas. The continued conflict and Russia's massive invasion of Ukraine in February 2022 demonstrate that warfare is still a problem in today's world, impacting China's ambitious military build-up and its threats against Japan and other allies of the United States in the Indo-Pacific. Though development varies, nations like Poland, Germany, Lithuania, and Japan have acknowledged

[49] Daniel Goure, "The Measure of a Superpower: A Two Major Regional Contingency Military for the 21st Century," The Heritage Foundation, January 25, 2013, https://www.heritage.org/defense/report/the-measure-superpower-two-major-regional-contingency-military-the-21st-century.

these challenges and are dedicated to strengthening their military capabilities. In contrast, the United States has not made a similar commitment, and as a result of inflation eating away at its spending, its military might has shrunk even more.[50]

3.3 Shift to Munitions-Versus-Target Model

Using a symmetrical correlation of forces technique, the United States assessed its military requirements in relation to the Soviet threat during the Cold War. To ascertain the needs for the fleet, army, and air force, planners directly compared tanks, planes, and ships with their Soviet counterparts.

These comparisons have become more difficult since the late 1980s due to developments in guided precision bombs and surveillance technologies. As demonstrated by wars such as Nagorno-Karabakh and Ukraine, modern fighting now centers on munitions-versus-target instead of platform-versus-platform. By reducing the quantity of ammunition required, precision weapons raise operational lethality and complicates contemporary warfare.

Due to the widespread use of precision-guided munitions, the number of *smart munitions* that the opponent has must be taken into account when calculating the number of platforms and soldiers needed for battle. Unmanned systems introduce additional intricacy. Precision and technology advancements make it possible to be more effective with less resources, but they also increase the cost of deploying such weapons.[51]

3.4 Strategic Advantages and Challenges

Precision and stealth weapons are examples of technological advances that enable smaller forces to have a bigger impact. Combat effectiveness is increased by contemporary U.S. military assets including computers, telecommunications, space-based systems, and networked operations. However, as seen in Ukraine, certain military tasks, such as seizing and protecting land, still need a sizable labor force.

Each element makes up a higher percentage of the total battle power when the troops are fewer. Sustaining high-intensity operations can be negatively impacted by casualties or equipment losses, particularly when numerous theatres are involved.

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[50] The National Institute for Defense Studies, "The New Normal of Great Power Competition: The U.S.-China-Russia Relationship and the Indo-Pacific Region NIDS International Symposium on Security Affairs 2022," 2022, https://www.nids.mod.go.jp/event/proceedings/symposium/pdf/2022/e_all.pdf.

[51] Shaan Shaikh and Wes Rumbaugh, "The Air and Missile War in Nagorno-Karabakh: Lessons for the Future of Strike and Defense," www.csis.org, December 8, 2020, https://www.csis.org/analysis/air-and-missile-war-nagorno-karabakh-lessons-future-strike-and-defense.

Future battles may be decided more by the skill and operational ability of the opposing forces than by differences in technology as sophisticated technology becomes more widely available and inexpensive. Capacity and preparedness will thus be essential. Because of the complexity and potential for bias in defense plan evaluations, budget submissions, and leadership comments, evaluating America's military might takes careful consideration. Reliance on perhaps edited or restricted documents is inevitable in the absence of such assessments.

3.5 The U.S. Joint Force and the Art of War

This section of study assesses America's defense strategy with regard to conventional hard power, which is the capacity of the American military to confront and subdue adversaries on a scale commensurate with critical national interests. Certain elements, like necessary strength, opponent expertise, political will, and speed—can be measured, while others—like future military requirements, range, detection likelihood, and radar cross-section, remain subjective and require judgment and experience.

Our evaluation combines quantitative and qualitative elements and is based on in-depth analysis of military and outside knowledge. Effectiveness in the military is both a science and an art. While individual military instruments such as weapons, platforms, and units can have an influence, their combined and coordinated might is greatly increased. Although difficult to measure, this employment principle is vital to combat and is acquired by experience.

This study does not analyze Reserve and National Guard components, which make up around one-third of the U.S. armed force, instead concentrating on the state of hard power itself. It is difficult to regularly assess these components because of a variety of variables, including availability, cost, reaction time, and political issues. However, without Reserve and Guard personnel, the U.S. military is unable to manage significant wars. The research takes into account the baseline combat power available in the Active component of each service in order to ensure consistency in yearly assessments. There are exceptions where substantial resources improve the preparedness of certain Reserve units, as four Army National Guard BCTs in the 2020 Index demonstrate.[52]

3.6 The Defense Budget and Strategic Guidance

The amount allotted to defense does not inherently determine the strength or posture of the US

[52] Heritage org, “Introduction: An Assessment of U.S. Military Power,” The Heritage Foundation, October 18, 2022, https://www.heritage.org/military-strength/intro-assessment-us-military-power.

military. Increased military might does not always follow from higher defense budgets if money is wasted or misappropriated. A competent, up-to-date, and prepared force requires adequate budget, yet funding on its own is insufficient. There is a general correlation between defense spending as a percentage of the federal budget or GDP and the military's status because the costs of equipment, personnel, and readiness are in line with general economic costs and technological advancements. The defense budget is a reflection of the priority given to national defense in federal spending.[53]

The United States government strikes a balance between defense expenditure and other governmental priorities when there is not a serious threat to the country's survival. The optimal process for establishing defense requirements involves recognizing national interests, analyzing the costs involved, assessing risks, and figuring out what has to be done to fight such threats. The security interests of the United States are at danger from any disparity between estimated requirements and actual defense spending.

Linking interests, threats, needs, resultant force, and budget is the methodology used in this index. Policy discussions on where to take risk in force modernization, capability for large-scale or numerous simultaneous operations, or force readiness occur when less money is spent than needed for a two-MRC force. The emphasis on competing with China and Russia has made these challenges more crucial. The resource requirements of war and the potency of well-trained and armed military formations have been brought to light by Russia's conflict with Ukraine.[54]

The Joint Force performs a variety of tasks, such as large-scale combat operations, regional participation, crisis management, strategic deterrence, aid to civilian authorities, and support for US diplomacy. While significant combat operations are rather seldom, happening approximately every 15 years, the military continuously performs other vital tasks.

The Indo-Pacific Command (INDOPACOM), Southern Command (SOUTHCOM), Africa Command (AFRICOM), European Command (EUCOM), Central Command (CENTCOM), and Northern Command (NORTHCOM) of the United States have all made plans to interact with the

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[53] Mandy Smithberger, "The United States Needs to Cut Military Spending and Shift Money to Two Pressing Threats: Pandemics and Climate Change," Bulletin of the Atomic Scientists, September 7, 2021, https://thebulletin.org/premium/2021-09/the-united-states-needs-to-cut-military-spending-and-shift-money-to-two-pressing-threats-pandemics-and-climate-change/.

[54] J Mcinnis, "RUSSIA and CHINA LOOK at the FUTURE of WAR MILITARY LEARNING and the FUTURE of WAR SERIES," 2023, https://www.understandingwar.org/sites/default/files/Russia%20and%20China%20Look%20at%20the%20Future%20of%20War_0.pdf.

nations in their respective areas.[55] These interactions strengthen ties, advance knowledge of regional dynamics, and highlight American security objectives. They can take many different forms, from small-unit training with a single partner to large-scale multilateral exercises. The services offer units that are either permanently based or temporarily rotated in various locations to support COCOM objectives. A base force big enough to consistently train, deploy, support, receive back, and prepare troops in order to satisfy COCOM demand is necessary to maintain these rotations.

The ratio of time spent at home to time deployed, or operational tempo or OPTEMPO, should ideally be at least 3:1 in order to allow soldiers to retain a healthy family life and provide units enough time for training and preparation. For instance, before redeploying, a unit that has been deployed for six months should spend eighteen months at home. This ratio requires an adequate number of soldiers, troops, ships, and aircraft.[56]

The Joint Force may be scaled to satisfy forward-based and forward-deployed demands if the main goal was peacetime involvement. Nevertheless, in order to seize a large combat operation, one must weigh the military might require winning potential war scenarios against the needs of COCOM, historical study of previous wars, assessment of present threats, and U.S. capabilities. Evaluations of possible conflicts with China or Russia during peacetime tend to underestimate the conditions necessary to prevail in a war. Estimates made during peacetime may miss the harsh truths that war exposes. The United States needs a force that is up to date, prepared, and efficient in all areas of combat to meet the challenges posed by these highly developed nations, according to national security policies from 2017 to 2023.[57]

The Biden Administration carried on the pattern of growing non-defense spending faster than defense spending in FY 2023. For the DOD base discretionary budget, $773 billion was the original proposal, representing a 4.1 percent increase from the year before. In contrast to the 10% increase in non-defense funding proposals for other federal agencies, this increase was, however, negligible. Congress decided that the defense budget was insufficient and added $45 billion to it in order to combat inflation and expedite the execution of the National Defense

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[55] US Central Command, "COMPONENT COMMANDS," Centcom.mil, 2016, https://www.centcom.mil/ABOUT-US/COMPONENT-COMMANDS/.

[56] CRS Reports, "The Fundamentals of Military Readiness," 2020, https://sgp.fas.org/crs/natsec/R46559.pdf.

[57] The White House, "National Security Strategy" (The White House, October 12, 2022), https://www.whitehouse.gov/wp-content/uploads/2022/10/Biden-Harris-Administrations-National-Security-Strategy-10.2022.pdf.

Strategy.[58]

3.7 Overview of China Conventional Military Capabilities

The People's Republic of China (PRC) is the main rival of the United States, according to its 2022 National Security Strategy, and it has the intention and increasing ability to change the global order. Congress is given access to China's political, economic, and military goals through the Department of Defense's yearly report on military and security developments involving the PRC, which highlights Beijing's objectives. Consolidating all facets of national power is the main goal of the PRC's policy in order to maintain a "leading position" in a long-term battle between various systems.[59]

The PRC poses the greatest and most pervasive threat to American national security as well as the free and open international order, according to the 2022 National Defense Strategy. In this pivotal decade, it is imperative to comprehend the military strategy, present operations, capabilities, and future modernization objectives of the People's Liberation Army (PLA). In 2021, the PRC became more adept at using the PLA as an instrument of statecraft, acting more aggressively and coercively throughout the Indo-Pacific area. The PLA now plans to further integrate mechanization, informatization, and intelligence by 2027 after apparently achieving its modernization objective of 2020.[60] If successful, these developments might improve the PLA's capacity to serve as the Chinese Communist Party's (CCP) reliable military tool, especially when it comes to seeking Taiwan unification.

Beyond conventional capabilities, the PRC is stepping up nuclear force modernization, diversification, and growth to bolster its "strategic deterrent." Concerns over China's unwillingness to talk about its growing nuclear, space, and cyberspace capabilities, however, are growing since they present threats to the strategic stability of the world.

Beijing's desire to change the present international rules-based system is highlighted by this research, which comes as the PRC strives for *national rejuvenation* by the time it turns 100 in

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[58]Alejandra Rocha and Michael E. O'Hanlon, "What's in Biden's $850-Billion Defense Budget Proposal?," Brookings, March 15, 2024, https://www.brookings.edu/articles/whats-in-bidens-850-billion-defense-budget-proposal/.

[59] USC, "U.S. Dept. Of Defense, Military and Security Developments Involving the People's Republic of China 2022, November 29, 2022 | US-China Institute," china.usc.edu, November 29, 2022, https://china.usc.edu/us-dept-defense-military-and-security-developments-involving-peoples-republic-china-2022-november-29.

[60] Indo-Pecific Defence Forum, "Implications of PLA Modernization," Indo-Pacific Defense Forum, August 17, 2023, https://ipdefenseforum.com/2023/08/implications-of-pla-modernization/.

2049. The PRC's strategic objectives, as outlined by Xi Jinping's projects such as the Global Development Initiative and the Global Security Initiative, require a favorable external environment in order to be achieved.[61]

3.8 Understanding China's Strategy

In China's recent National Strategy, the term, "the great rejuvenation of the Chinese nation" was introduced by the regime and they are preparing to achieve this goal by 2049.[62] This entails a concerted attempt to modernize militarily, socially, and politically in order to increase national strength, improve governance, and reshape the international order to suit Beijing's goals and system. The PRC believes that serious obstacles to its national plan exist because the US is using a whole-of-government strategy to restrain China's ascent. China sees strategic competition as a conflict between strong countries and diametrically opposed ideologies. Chinese officials blame the U.S. for becoming more combative and structural changes in the international system for the escalating rivalry.

China's strategy consists of concentrated efforts to build up and strengthen its national power on the inside as well as the outside, with the goal of securing a leading position in an ongoing systemic competition. The PLA's 2027 centennial goals will be significantly impacted militarily and strategically by the results of the 20th CCP National Congress. According to the Congress study, the PLA should modernize more quickly over the next five years, with a focus on strengthening its *system of strategic deterrence.* The Central Military Commission (CMC) was led by Xi Jinping, who also chose members with political continuity, military modernization experience, and operational experience in Taiwan.[63] Establishing a *community of common destiny* to bolster its national rejuvenation plan is the goal of China's foreign policy. Beijing's national policy and the political and administrative structures of the CCP are the sources of its revisionist aspirations for the international order. China utilized a range of diplomatic strategies

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[61] Kyle Amonson and Dane Egli, "The Ambitious Dragon: Beijing's Calculus for Invading Taiwan by 2030 > Air University (AU) > Journal of Indo-Pacific Affairs Article Display," www.airuniversity.af.edu, April 24, 2023, https://www.airuniversity.af.edu/JIPA/Display/Article/3371474/the-ambitious-dragon-beijings-calculus-for-invading-taiwan-by-2030/.

[62] Marc Berkowitz and Chris Williams, "Strategic Implications of China's Cislunar Space Activities," 2023, https://nssaspace.org/wp-content/uploads/2023/08/Strategic-Implications-of-Chinas-Cislunar-Space-Activities-8.21-final.pdf.

[63] Mej Gen Ravi Arora, "IMR Feb 2023 PDF Full | PDF | People's Liberation Army | China," Scribd, 2023, https://www.scribd.com/document/721376292/IMR-Feb-2023-pdf-full.

in 2021 to weaken the influence of the United States and its allies, including highlighting the country's withdrawal from Afghanistan and denouncing U.S.-backed security alliances like the Quad (Australia, India, Japan, and the United States) and AUKUS (Australia-United Kingdom-United States).[64]

In order to create a unified National Strategic System and the necessary capabilities to meet its objectives for national rejuvenation, China's Military-Civil Fusion (MCF) plan integrates its security and development agendas. In order to strengthen China's total national might, this strategy focuses on creating and purchasing cutting-edge dual-use technology for military purposes as well as reorganizing the country's defense science and technology sectors.

The MCF strategy is comprised on six interconnected initiatives:[65]

- Integrating Defense and Civilian Industries: Combining China's economic foundation for defense with its industrial and technological sectors for civilian use.
- Leveraging Innovations in Science and Technology: Applying advances in science and technology to both military and civilian applications.
- Developing Talent: Combining civilian and military experience and knowledge.
- Integrating Military Requirements with Civilian Infrastructure: Using civilian building for military objectives and integrating military requirements with civilian infrastructure.

  Using Civilian Services for Military Objectives: Making use of civilian transportation and services for military objectives.

  Extending National Defense Mobilization: Improving China's system for mobilizing the

[64] Christopher B. Johnstone, "China's Evolving Counter Intervention Capabilities and Implications for the United States and Indo-Pacific Allies and Partners," *Www.csis.org*, 2024, https://www.csis.org/analysis/chinas-evolving-counter-intervention-capabilities-and-implications-united-states-and-indo.

[65] MANOJ JOSHI, "China's Military-Civil Fusion Strategy, the US Response, and Implications for India," orfonline.org, July 21, 2023, https://www.orfonline.org/research/china-s-military-civil-fusion-strategy-the-us-response-and-implications-for-india.

national defense to incorporate all pertinent facets of the economy and society in preparation for both conflict and diplomacy.[66]

3.9 China's Forces, Capabilities, and Power Projection

In order to function as an efficient combined force, the PLA seeks to modernize and improve its capabilities in all areas of combat, including land, air, sea, nuclear, space, counterspace, electronic warfare, and cyberspace.[67]

Strategic Objectives: Countering third-party interference in regional crises, projecting strength internationally, and developing the capacity to "fight and win wars" against a "strong enemy" are the main priorities for the PLA.

Advancement from 2021 to 2023: The PLA kept up its institutional changes, deployed cutting-edge domestic systems, increased preparedness, and enhanced joint operations capabilities.

3.10 Particular Development in Branches

People's Liberation Army (PLA): The PLA is the main ground force of the PLA, with around 975,000 members serving on active duty. It concentrated on standardizing training techniques and creating realistic training situations in 2021. Examples of these were joint exercises with Russia on a wide scale and amphibious training with civilian vessels and the PLAN.

People's Liberation Army Navy (PLAN): With over 340 ships and submarines, including 125 significant surface combatants, the PLAN is the largest navy in the world in terms of quantity. Even with the handover of 22 corvettes to the China Coast Guard, the PLAN is modernizing with the launch of new amphibious assault ships and cruisers.[68]

PLAN Aviation and the People's Liberation Army Air Force (PLAAF): With more than 2,800 aircraft, including 2,250 combat aircraft, they collectively constitute the third biggest aviation force in the world as well as the largest in the area. The PLAAF is quickly modernizing,

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[66] Audrey Fritz, "China's Evolving Conception of Civil-Military Collaboration," www.csis.org, August 2, 2019, https://www.csis.org/blogs/trustee-china-hand/chinas-evolving-conception-civil-military-collaboration.

[67] Indo-pacific Defence Forum, "Implications of PLA Modernization," Indo-Pacific Defense Forum, August 17, 2023, https://ipdefenseforum.com/2023/08/implications-of-pla-modernization/.

[68] USC, "U.S. Dept. Of Defense, Military and Security Developments Involving the People's Republic of China 2022, November 29, 2022 | US-China Institute," china.usc.edu, November 29, 2022, https://china.usc.edu/us-dept-defense-military-and-security-developments-involving-peoples-republic-china-2022-november-29.

bringing in UAVs and aircraft manufactured in the country, and it has unveiled the H-6N, the first air-to-air refuellable bomber with nuclear capability.

The PLARF, or People's Liberation Army Rocket Force, is in charge of China's nuclear and conventional troops stationed on key ground. It launched more ballistic missiles for training and testing in 2021 than the rest of the world combined (excluding war zones), with over 135 launches. With the goal of having at least 300 additional ICBM silos, China is continually expanding its ICBM silo fields.[69]

Force for Strategic Support (SSF): Strategic space, cyberspace, electronic, information, communications, and psychological warfare assets are centralized under the SSF, a theatre command-level organization. The main goals are space dominance and information sphere control, which are crucial for contemporary "informatized warfare." The SSF makes investments in robotic space exploration, human spaceflight, satellite communication, navigation, weather, and space-based ISR.[70]

China's policy seeks to limit American access in the larger Indo-Pacific area and to prevent American presence close to its borders. Although the First Island Chain is where the PLA's anti-access/area-denial (A2/AD) capabilities are most potent, they are also becoming more prevalent in the Philippine Sea and other parts of the Pacific. Ocea

Long-Range Precision Strike and ISR: The PLA doctrine highlights the significance of precision strikes in contemporary battles in all areas of warfare. Precision weapons are regarded as instruments for "war control" to moderate escalation and as force multipliers.

China has a strong Integrated Air Defense System (IADS) that stretches 300 nautical miles (556 kilometers) from its coast and covers its land areas. Surface-to-Air Missile (SAM) systems, fighter aircraft, and early warning radar networks are all part of this system. The IADS range is further increased by radars and air defense missiles stationed on South China Sea installations. Strategic objectives are shielded from airborne assaults and long-range cruise missiles by point defenses.

Hypersonic Weapons: The PLA's missile force is changing as a result of the 2020 deployment of

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[69] Maj. Christopher J. Mihal J. Mihal, "Understanding the People's Liberation Army Rocket Force Strategy, Armament, and Disposition," Army University Press, 2021, https://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/China-Reader-Special-Edition-September-2021/Mihal-PLA-Rocket-Force/.

[70] I. M. R. Reporter, "PLARF and SSF Forces and Capabilities, Developments in 2021-22," IMR, March 15, 2023, https://imrmedia.in/plarf-and-ssf-forces-and-capabilities-developments-in-2021-22/.

the DF-17 hypersonic glide vehicle (HGV)-armed Medium-Range Ballistic Missile (MRBM). This system is intended to target foreign military sites and fleets in the Western Pacific and may eventually replace certain earlier Short-Range Ballistic Missile (SRBM) systems.[71]

3.11 Comparative analysis of US and China Military Strengths

Due to globalization, World politics is dominated by the United States and China in the current structure of the world and each of these power's actions affects the stability of the world. They are rivals to the bitter end so far as the military strength is concerned. The existence of similarities and differences in the analyzing of the powers of two countries with regards to military strength is converted in this research through the factors of defense budget, manpower, technology and strategic strength of the United States and China respectively. Technology plays an important role in the modern world, especially in the forces. Both nations are involved in the production of the most modern military systems like artificial intelligence, smart ammunition, and cyber warfare. The United States employs the technical supremacy to maintain its hegemony in several domains concerning the kinetic operation, namely the air, the sea, and outer space domains. Human resources still retain a very significant place and value in military power. The labor force is considered to be highly skilled and voluntary in the United States military where the tools and instructions deployed are also considered to be up to date. The People's Republic of China, with the largest number of standing armies in the globe continues to modernize it, with absorption and quality highlighted.

Strategic capabilities are such things as nuclear dissuasion, presence projection and globe encompassing. The United States of America is thus capable of carrying out a vast number of operations through such military stations globally, hence admits to providing sustainable operations and rapid deployment.[72] Thus, China's policy is preoccupied with building the capacity to exert power beyond its shores and managing the region especially the Indo-Pacific region.

Comparing the given countries, this paper elucidates the strengths, resources, work force, and

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[71] Ankit Panda, "Introducing the DF-17: China's Newly Tested Ballistic Missile Armed with a Hypersonic Glide Vehicle," thediplomat.com, December 28, 2017, https://thediplomat.com/2017/12/introducing-the-df-17-chinas-newly-tested-ballistic-missile-armed-with-a-hypersonic-glide-vehicle/.

[72] Barbara Lippert and Volker Perthes, "Strategic Rivalry between United States and China: Causes, Tragectories, and Implications for Europe Zur Verfügung Gestellt in Kooperation Mit / Provided in Cooperation With: Stiftung Wissenschaft Und Politik (SWP)," April 6, 2020, https://doi.org/10.18449/2020RP04.

technology because they define the tendencies of the global military and explains the complexity of a military competition between the US and China. China has hiked up its defense budget by a great deal over the past two decade or so. SIPRI estimates suggest that China is the second-largest military spender only next to the USA though China is not nearly as transparent with its budget as the USA is. China is projected to spend $252bn on defense in 2021.[73] At present, China is strengthening its defense system focused on the creation of missiles, influence in cyberspace, and naval forces' development.

Artillery is one of the primary elements or weapons for achieving military domination, and for its control, new technologies should be created. Over time, the United States has been regarded as the world's superpower in military technology due to the development that has been made in information technology, armaments, and aircrafts. US defense companies such as Lockheed Martin, Boeing, and Northrop Grumman Industry are part of the defense industry that makes modern weaponry including the accurate guided missiles, stealth airplane, and UAVs.[74] These weapons make the US troops tactically superior for many reasons. Though, China has been animated in recent years concerning the enhancement of military technologies. Schemes like the 'Made in China 2025' intend to make high-tech industries as China's competitive advantages for world market and minimize dependence on foreign counterparts. They have proved its growing muscle in stealth, cyber, and missile defense with the development of new generation weapon systems such as Type 055 destroyer, DF-21D anti-ship ballistic missile, J-20 stealth fighter aircraft.[75] As all forces and operations in the military entail, quality of labor is as important as quantity in the military. Today, the United States of America hosts an all-volunteer force of about 1,3 million of the active-duty personnel famous for its professionalism, training and technical expertise, backed by about 800, 000 of reservists and National Guard troops. Cognitive training, modern education, and training courses are offered to the American soldiers, so that they are ready for various tasks. That is while China has the largest reserve army in the world today with roughly 2 million people in the active duty. Currently, the PLA focuses on training quality enhancements, equipment, and the profession. Another capability, that is a reserve army

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[73] SIPRI, "SIPRI Military Expenditure Database | SIPRI," Sipri.org, 2023, https://www.sipri.org/databases/milex.
[74] Anonymous, "The Three Largest Defense Companies in the World Are," Stanford.edu, 2020, https://web.stanford.edu/class/e297a/U.S.%20Defense%20Industry%20and%20Arms%20Sales.htm.
[75] James McBride and Andrew Chatzky, "Is 'Made in China 2025' a Threat to Global Trade?," Council on Foreign Relations, May 13, 2019, https://www.cfr.org/backgrounder/made-china-2025-threat-global-trade.

together with paramilitary formations, adds to the manpower strength of China's military.

Table 3.1: Comparison of Hard power

Country	Active Personnel	Reserve Personnel	Paramilitary Forces	Defense Budget
China	2,035,000	510,000	6 25,000	2.27 Trillion
US	1,328,000	799,500	0	8.3 trillion

Table 3.2: Air Power

Country	Total Aircraft	Fighter Aircraft	Dedicated Attack	Transports	Trainers	Special Mission	Helicopters
US	13,209	1,854	896	957	2,648	695	5,737
China	3,304	1,207	371	289	402	112	913

Table 3.3: Land Power

Country	Tanks Strength	Armored Vehicles	Self-Propelled Artillery	Towed Artillery	Mobile Rocket Projector
US	4,657	360,069	1,595	1,267	694
China	5,000	174,300	3,850	1,434	3,180

Table 3.4: Naval Power

Country	Fleet Strength	Aircraft Carriers	Helo Carriers	Submarines	Destroyers	Frigates	Corvettes	Mine Warfare
US	472	11	9	64	75	0	23	8
China	730	2	3	61	49	42	72	36

Source: Global Fire Power-2020[76]

3.12 Regional Presence and Alliances

Any military force projection strategy must, in this way; consider a nation's presence in the region and alliances. The United States of America has numerous military facilities around the world, forward operations, allied exercises, and sustainment. Significant and strategically important American facilities and bases on the Pacific Rim assets like those that are in Guam, Japan or South Korea allow for a speedy response to threats that include potential wars in the Korean Peninsula or the South China Sea. Official defense agreements that the United States has with Australia, South Korea, Japan, and the Philippines also support the US security interests in the Pacific.[77]

Unlike the USA which is more spread out, China has been leveraging on the BRI to grow its strategic outreach. This infrastructure development program takes steps to increase the interaction and trade between countries in Eurasia and other parts of the world by funds for ports, trains, and infrastructure in more than Southeast Asia, Africa and Middle East.[78] China also deepens its military cooperation with neighbors within the framework of the SCO and bilateral defense agreements. Thus, in the contemporary system of armed forces, one can speak about the growing roles of cyber and space warfare. Many investments have been made by both the US, as well as China within these sectors. Cyber warfare is well developed in the United States, the NSA and the United States Cyber Command engages in cyber operations while at the

[76]GFP, "Global Firepower - 2020 World Military Strength Rankings,"www.globalfirepower.com, 2024, https://www.globalfirepower.com/.
[77] Jonathan Stevenson, "Overseas Bases and US Strategic Posture," www.iiss.org, September 28, 2022, https://www.iiss.org/en/online-analysis/online-analysis/2022/09/overseas-bases-and-us-strategic-posture/.
[78] Hong Yu, "China's Push for the BRI in a Changing World: Origins and Motivations," *Asia in Transition* 26 (January 1, 2024): 1–21, https://doi.org/10.1007/978-981-99-9633-9_1.

same time protecting against cyber operations. Another important factor of military operations is space-based assets for communication, surveillance, and navigation relevant to the USA.

China's information warfare capabilities are growing rapidly as state-backed hackers attack firms, governments, and key assets. For instance, the Chinese military has formed cyber teams for the purpose of interrupting the communication of the opposition, spying on them and that of psychological warfare. China apart from manufacturing anti-satellite (ASAT) weapons has also sent its own communication and navigation satellites into orbit.[79] These developments make it possible for some countries to develop space weapons, yet the superior military strength of the US in space still needs justification.

3.13 Conclusion

Comin to the conclusion of the chapter, China and US both are having strong armed forces, and their pros and cons are relative in nature. Due to a large number of military facilities around the world, high-tech tools and partners, the United States can quickly respond to threats to international security. Meanwhile, the Chinese has been aggressively transforming their military into a modern force that has leveraged on technology to assert influence on strategically vital areas.

Thus, as their competition deepens, policymakers, analysts, and military strategists require knowledge on China's and the United States' military capabilities. There still is competition in such spheres as technology, space, and influence in regions; however, both countries do not aim at an open confrontation. Most of these dynamics are expected to affect world security and geopolitics in the future.

[79] Bill Gertz, "China's Space Warfare Plans | RealClearDefense," www.realcleardefense.com, January 5, 2024, https://www.realcleardefense.com/2024/01/05/chinas_space_warfare_plans_1002957.html.

Chapter 4

FUTURE PROSPECTS OF CONVENTIONAL DETERRENCE

4.1 Introduction

The chapter will provide detailed discussion the future prospects of the conventional deterrence between US and China. It is significant to highlight the current trend in the world, especially the advancement of technology is fast and recent development has been witnessed especially in the military as well. The modern warfare has been characterized by the deployment of technologies, particularly AI of the 21st century that is rapidly revolutionizing the capacities in different fields.[80] AI, for instance the Mars rovers, Spirit and Opportunity that has been in operation since 2001, has given machines the abilities to learn, plan, and decide like humans.

However, although AI has the potential for improving knowledge exchange and innovation, its incorporation into military operations creates profound questions about a nation's security, command structures, and global stability. For instance, the president of Russia Putin has pointed to the importance of AI in changing the global power relations, not to mention the fact that AI is set to redefine future warfare.

The use of AI in military conflicts, for example, in the war between Ukraine and the Russian Federation, is a prime example of the contentious but present phenomenon of modern warfare. Some of the tools and technologies applied in the contemporary wars include the drones, satellites and cyber and they have been crucial in recent wars which shows that warfare technology is rapidly changing.

As for the problems which arise in connection with the creation of Lethal Autonomous Weapon Systems (LAWS), one can mention the following: strategic miscalculations, as well as the destabilization of nuclear states. Most of the countries today are involved in the development of AI technologies in military systems with most countries such as Russia, China, and the United States investing hugely in the development of these technologies.

Incorporation of AI in UAVs, missile systems, submarines, and aircraft are the ongoing process of using technological dominance in defense mechanisms. Such approaches as the US National

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[80] Adib Bin Rashid et al., "Artificial Intelligence in the Military: An Overview of the Capabilities, Applications, and Challenges," *International Journal of Intelligent Systems* 2023 (November 6, 2023): 1–31, https://doi.org/10.1155/2023/8676366.

Security Strategy 2022 focus on the coordinated acquisition and application of the AI systems by the like-minded partners in order to protect mutual military interests.

Prospectively, China's plan to make the country the AI superpower by 2030 and development of AI in defense systems depict a race to attain technological superiority. However, nations like Russia and Israel are steady in developing AI uses in specific areas like naval and anti-missile functions.

Deterrence is the core characteristic of nuclear weapons as political instruments to prevent the use of force rather than to apply force. Should decision-making on the use of force be delegated to artificial intelligence systems, the efficacy of threats and the long-standing norm not to use nuclear weapons could be undermined, which may change the nature of threats and threats' coercion in the relations between the nuclear states.

This is due to its ability to transform the way that international debates on the involvement of human beings in the management of military technology are conducted. There are some who propose that there should not be any use of LAWS in the first place and that there should be no development of these systems at all. The Confidence Building Measures (CBMs) and non-binding Transparency and Confidence Building Measures (TCBMs) are regarded as provisional solutions to these severe global security threats.

Political scientists recommend temporary bans on the AI-driven military application, regarded as the most efficient strategy to address these novel threats, until the legally non-binding treaty is reached.

4.2 Autonomous battlefields under the Umbrella of Deterrence

Unmanned aerial vehicles are among the recent revolutionary technologies taking root in modern warfare and ranked as the third revolution in warfare with gunpowder and nuclear weapons as the other two. Their effectiveness was seen in the Second Nagorno-Karabakh War where Azerbaijan armed with Israeli and Turkish drones including the lethal 'Harop 'loitering munitions provided the beating edge against Armenia's conventional forces. This was a turning point with the national militaries actively procuring the unmanned aerial systems.

The US National Security Commission on AI also explains how self-governing technologies redefining warfare are, and it calls for significant expenditures in this domain. Today China, Russia, Great Britain and Israel are actively developing and purchasing new generations of drones expecting their operational advantages.

Technological development like Li-ion battery facilitates production of cheap micro and small drones that are capable of coordinated operations in swarms. These swarms, if incorporated into a network and working at a pace as fast as a machine, can overtake old radar systems and pose a threat to high-value military equipment.

Of specific worry are self-flying quadcopters they are endowed with a computer vision for identification and locking of targets and could be used in 'targeted killings' besides the conventional combat zones. This development adds a new strenuous dimension of persistent and remote threats.

Military drones are another revolutionary factor in recent military actions and can be seen as the element with both direct coercive power and the strategic challenges that have an impact on the contemporary warfare doctrines and defense worldwide.

4.3 Relevance of the Contemporary Framework

In this context, the signaling aspect is a key component underlined in the framework to support the use of LAWS for deterrence. AI based systems bring uncertainty to the interactions for both the users and the adversaries. Governments have the dilemma of making the large-scale and real-world tests for their algorithms transparent while keeping the data from foreign adversaries, which results in the phenomenon of deliberate ambiguity. Open testing serves to eliminate uncertainty for the potential LAWS user's as well as communicate technical capacity to potential adversaries, while the safeguarding of these trials maintains a veil of exclusivity and decreases the likelihood of an AI precipitated security dilemma within the Great Power system.

Transparency helps in the deterrence function and assists with the testing and evaluation of LAWS, thus improving the signaling of capabilities. Research has found that clarity of the initial signal of capability and intention is the best way to prevent an aggression; ambivalence provokes an aggression. The signaling process becomes challenging when it has to do with the automated systems because different autonomous platforms analyze the messages received. PLA strategists expect the future warfare to be characterized by UAVs, MUMTs, and AI-driven decision-making to counter the opponents. These advances are heading to solve PLA leadership's problem in decision making where the conditions are already unknown or unpredictable.

The PLA's Academy of Military Science issued a report in 2013 to the effect that strategic military deterrence is supplemented by the principles of using high-tech equipment and Informa-

ionization, as well as introducing the factor of uncertainty and randomness in the assessment of the opponent through new military concepts and theories. LAWS translate into new unpredictabilities regarding China's capability to foresee its forces' actions and manage adversary autonomous systems, thereby raising the possibility of accidental escalation and great power war.

China's AI military research focuses on the autonomous hardware that includes robotic tanks, swarms of drones, and remotely operated submarines. Intelligentzed warfare is considered the fourth revolution in the military affairs that has a major influence on the conventional military operational concepts. Intelligentized warfare is founded on artificial intelligence and incorporates the latest technologies into commanding, equipment, tactics, and decision-making at various levels of conflict. They consist of human-machine integrated groups of vehicles where self-driving systems have authoritative positions. An example is *latent warfare* whereby LAWS are placed in strategic positions and are then set on autopilot for aggression against the hostile party or structures. Thus, AI and LAWS are considered by the U. S. military as necessary tools to accomplish the mission in the present and future conflicts. Autonomy is seen by the Americans as providing fundamental protection and lethality benefits and helping the commanders to decide more speedily and accurately in rivalry and emergencies. The United States and China are developing disruptive capabilities and weapon systems and military concepts involving LAWS, but there is no shared understanding of how each side will interpret the other's actions in competitive scenarios, and thus the risk of inadvertent escalation to conflict is high.

Furthermore, the need for high-quality adversary data to achieve sufficient quantities to assure predictable performance of LAWS in conflict situations can breed 'Military Deception'. This would deceive the adversary to doubt their information and, therefore, the capacity of autonomous platforms facing real enemies

4.4 Advent of Autonomous Weapon: more Room for conventional Deterrence in National security Strategy

The proponents of autonomous weapons systems have noted the following advantages in the military. First of all, these systems increase the efficiency of missions by using less people, being force multipliers. They also increase the theater of operations, get to places that were previously inaccessible and decrease the loss of human life by taking soldiers out of harm's way.

The Department of Defense's Unmanned Systems Roadmap: 2007-2032 also offers further reasons for more autonomy in weapons. Hence, robots are more appropriate to be used for ''boring, toxic, or lethal' operations: for example, sustained search and rescue operations, contact with toxic substances, or dealing with improvised explosive devices. Lethal autonomous robots pose a threat as Major Jeffrey S. Thurnher of the U. S. Army has explained they are fast and accurate when it comes to striking, even when their links to the controlling authority are cut off.

The possible benefits of using military robots are cutting costs. David Francis in The Fiscal Times of June 2013 notes data from the Department of Defense that pegs the yearly cost of a soldier in Afghanistan at about $850,000, while the TALON robot, an armed small rover, goes for $230,000. General Robert Cone noted that further reliance on support robots could lower the size of an Army brigade form 4,000 troops to 3,000 but retain the force's efficiency.

In his article in the Air Force Law Review Air Force Major Jason S. DeSon enumerates the benefits of the use of autonomous aerial weapons systems. Robot pilots do not get tired from high-G maneuvers and other demands on their mental facilities as human pilots do. Fully autonomous planes could also randomly move and perform actions that the opponent could not comprehend. Air Force Captain Michael Byrnes analyzes that a single unmanned aerial vehicle that is maneuvered by a machine could wipe out a whole fleet of manned aircrafts using a few bullets and enough gasoline.

A 2012 Defense Science Board report for the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics identified six key areas where advances in autonomy would benefit unmanned systems: perception, planning, learning, human-robot interaction, natural language understanding and coordination between different agents.

Sensors and sensing compose perception, which include the physical components and the software components. Planning involves determining a sequence of activities that when executed, leads to the occurrence of certain events of interest while using algorithms in decisions where people are not involved. The term learning in the context of AI could mean machines analyzing large data and arriving at usable and in some cases better knowledge such as self-driving for cars on the road.

Human-robot interaction focuses on how people interact with robots that exist in the physical environment and must be studied and developed in collaboration with engineers, psychologists,

cognitive scientists, and communication specialists. Autonomy involves the use of natural language processing which allows systems to work with language used in the user's instructions whereby the users do provide general objectives instead of specific commands. Finally, distributed tasks entail assigning work to be done to many robots, software agents, or people, recognizing each capability and ensuring that collective objectives are met, mimicking human-like cooperation.

4.5 Conclusion

The chapter provided detailed discussion on the future dynamics of the conventional deterrence between US and China. It highlighted the contemporary discourse in the world, politics with special reference to the advancement of technology. Albeit, it is rapid and emerging development and has been witnessed not only in the military but in almost every field of the study. The modern warfare has been characterized by the deployment of technologies, particularly AI of the 21st century that is rapidly revolutionizing the capacities in different fields. The chapter concludes that these conventional domains cannot be ignored as the future wars will be based on these technological advancements and the countries having these capabilities will play leading roles due to their command in the above-mentioned technologies.

The coming chapter is based on the inferences drawn by the research and will highlight the main finding of the study. Next chapter will provide the inclusive summary of the research, which will significantly enhance the knowledge base on this subject area.

Chapter 5

CONCLUSION

5.1 Summary

At the end of the first chapter of the research, the reader is introduced to Deterrence in a manner that shows it assumes different forms and has evolved over time from the conventional nuclear deterrence to the modern-day drones. In the sphere of national security, prevention of potential threats is normally linked with nuclear capacities, however, in the epoch of nuclear weapons, the largest part of military determent continues to utilize traditional forces. This fact is usually overlooked since it is typical to fail to notice successful deterrence. This Research aims to focus on the subject of conventional deterrence and discuss its relevance within the framework of the security in the early years of the 21st century taking into consideration the phenomenon of automatic weapons. In a nutshell, one could define deterrence as a process of discouraging someone from doing something that he or she wanted to do by making them expect that the negative outcome of this action will be worse than the positive outcome of not taking it. There are many situations where deterrence is needed and it should be studied and applied, for example nuclear threats, or crime prevention. Still, this discussion mainly concentrates on preventing interstate aggression and the kind of actions like starting a conflict or a military attack. and increasing the level of military conflicts The field of emerging technologies is characterized by unstoppable growth in terms of development. This dynamic environment covers a broad range of emerging technologies including artificial intelligence, robotics and drones, quantum computing, 3D printing and biotechnology. The rapid transformation of this field can bring significant changes into the world as many vitally important spheres of human life are to be affected, including politics, economy, and international relations between the leading states.

In the concluding part of second chapter the research understands that through open testing and evaluation of Deterrence, there is better signaling of the LAWS capabilities. Research indicates that the initial signaling of capability and intent is best suited in preventing conflict as ambiguity encourages instigation of conflict. Signaling becomes more challenging when the different messages come from other systems which are also of autonomous nature. PLA strategists expect future combat to be characterized by unmanned systems, manned-unmanned systems teaming, and artificial intelligence decision making to defeat opponents. These advances were intended to

solve the PLA leadership's issues in making decisions under conditions of risk and uncertainty.

According to the PLA's Academy of Military Science in its report in 2013, the strategic military deterrence is supported by the advanced equipment and technology, as well as the application of the uncertainty and the unknown variable into the opponent's cognition in the new military concepts and doctrine. LAWS introduce certain unpredictability in China's ability to anticipate its forces' actions and manage the adversary's autonomous systems and, hence, the risk of inadvertent escalation and large-scale war This research will theoretically examine the effect of AI-driven modernization on conventional deterrence with an attempt to answer whether and to what extent deterrence will be intact when states with RMA-equipped forces confront conventional warfare situations.

Despite the ongoing scholars' arguments as to whether the current formulation of RMA technologies is revolutionary or evolutionary in nature, technology is undeniably a significant factor in shaping modern warfare. As for the limitation of this study, the subject examines the effects of AI developments but excludes emerging. It is recognized more and more that change is a long-term process, which needs doctrinal and organizational changes, quality training, personnel management and defense management, smart acquisition and high-tech military supported by effective logistics. In this research, RMA and transformation are used indistinguishably and it is postulated that the militaries capable of conducting RMA are well suited for high intensity conventional wars and are not very effective against non-conventional enemies.

Military doctrine and strategy are also a significant influence on the organization, training, and employment of a nation's armed forces, more especially in the conclusion of third chapter. Due to the differing security threats and goals, military doctrines of China and the US are different. The full-spectrum dominance concept of the United States is to dominate the information spectrum, cyber-space, space, the aerial, maritime, and terrestrial. The readiness and striving to push forces forward, as well as utilizing technological advantage in order to be always one step ahead of the competitors are viewed as highly important elements of this strategy. However, the Chinese strategy of "Active Defense" focuses on protecting one's rights and boundaries and depriving the opponents and potential rivals especially the ones possessing superior technology than the Chinese military. This approach includes building capabilities that are unequal in nature like anti-access/area denial (A2/AD) systems against perceived threats.

Both China and the United States possess significant nuclear capabilities that have become essential to their national security doctrines and powerful deterrents to potential aggressors. Strategic bombers, ballistic missiles and aircraft, and land based, and sea based intermediate nuclear capability missiles. Together with the Byes, forms the nuclear triad that the United States of America possesses. Thus, the strategic flexibility and diversification of this nuclear posture guarantees the sustainability and efficiency of America's nuclear threats. China, for instance, practices a minimum credible nuclear deterrent strategy, in which it wants its nuclear force to be strong enough to discourage its opponents, but not strong enough that it will spur the United States and Russia to escalate the arms race again. China nuclear arsenal is made up of few strategic bombers, SLBM and the land-based ICBMs.

China and US both are having strong armed forces, and their pros and cons are relative in nature. Due to a large number of military facilities around the world, high-tech tools and partners, the United States can quickly respond to threats to international security. Meanwhile, the Chinese has been aggressively transforming their military into a modern force that has leveraged on technology to assert influence on strategically vital areas.

Thus, as their competition deepens, policymakers, analysts, and military strategists require knowledge on China's and the United States' military capabilities. There still is competition in such spheres as technology, space, and influence in regions; however, both countries do not aim at an open confrontation. Most of these dynamics are expected to affect world security and geopolitics in the future.

This particular section of the study recapitulates the findings made in the concluding section of the fourth chapter; where the research looks into how AI along with autonomous systems could revolutionize the future warfare. The more and more use of unmanned systems in battlefields, progress in commercial AI, and interest of many nations in military usability of AI and autonomy point towards the fact that these systems will remain in future conflicts. This creates doubts about deterrence and escalation when decisions are taken in microseconds and many fewer human beings are involved.

First, as an exploratory research this paper outlines some of the major concepts in deterrence, briefly describes AI and autonomy, examines some of the factors that may affect the deterrence and escalation with the use of these systems, describes a war game involving multiple countries with added AI and advanced autonomous systems and explores the consequences of these

developments in the realm of deterrence and escalation and finally outlines the direction of the next steps in further research.

5.2 Analysis

Organizational, training and employment concepts are significant indicators of the military doctrine and strategies that are in place within the context of a particular country's armed forces. There is a clear distinction of their military doctrines as resulting from China and US's different security concerns and strategies. The US strategy referred to as the *full-spectrum dominance* seeks to dominate every facet- cyberspace, space, air, sea and land. It is important to be prepared, to push forces and to use technological advantage to keep the rivals one step ahead of them and these are all the key features of the strategy. On the other hand, China adopts the *active defense* policy; it defends its interests and borders and hinders prospective competitors especially those who possess superior technology compared to China. This has involved building up destabilizing capability advantages like anti-access/area denial (A2/AD) to deter the identified threats.

China and the United States, the two countries in question in this thesis, possess large nuclear arsenals that are considered essential in their respective countries' national security strategies and that have the capacity to deter potential enemies. This is the nuclear triad that the United States of America possesses, namely the strategic bombers, the land-based ICBM and the SLBM. Thus, the mentioned flexibility and diversification of the nuclear posture guarantee the efficiency and sustainability of the US nuclear deterrence. China, on the other hand, uses the minimum credible deterrence strategy so as to maintain its nuclear arsenal strong enough to discourage its enemies without necessarily competing with the other nuclear giants such as the United States and Russia. Some of Chinese nuclear capabilities include Few strategic bombers, SLBMs and land-based ICBMs. Although China and the US possess potent armed forces capabilities, the advantages and disadvantages of these are not the same. Because of the largest empire of military installations, technological advancement as well as memberships in the world, the United States is able to quickly respond to threats that endanger the security of the world. In the meantime, China has been gradually building up its military forces to leverage technology to enhance its influence over the key strategic areas.

While China and the US step up competition, policymakers, analysts, and military strategists have to know the two countries' militaries. Competition is still present over critical factors of technology, space, and regional power despite both powers' efforts to avoid direct confrontation.

They will possibly continue to shape world security and geopolitics in the future periods.

After creating the scenario this will be the future of deterrence in the presence of anonymous weapons, we hypothesize that different human-machine configurations affect escalation in the following ways: After creating the scenario this will be the future of deterrence in the presence of anonymous weapons, we hypothesize that different human-machine configurations affect escalation in the following ways:

Human presence and decision-making: Lower escalatory dynamics due to slower, human decision-making but higher costs of miscalculation because human lives are at stake.

Machine presence with human decision-making: Lower escalatory dynamics and lower costs of miscalculation due to reduced risk to human lives, as seen with U.S. forces in the war-game.

Human presence with machine decision-making: Higher escalatory dynamics due to rapid machine decision-making and higher costs of miscalculation, as observed with Chinese forces.

Machine presence and decision-making: Higher escalatory dynamics with lower costs of miscalculation since human lives are not directly at risk.

When adversaries have different configurations, the responsibility to de-escalate may fall more heavily on one side.

Machines may struggle with understanding human signaling in deterrence, especially for de-escalation. AI programmed for aggressive tactical and operational exploitation might misinterpret.

5.3 Verification of Hypothesis

The research has proved that the advent of autonomous weapons has created instability in the strategic dynamics of the US and China, because of the disruptive technologies. There are a lot of policy spectrum which needs to be dressed in future. Advent of thinking machines in the decision-making process had been making wars costly and more destructive. The research also provided an overview of cheap disruptive technologies, and how a relatively weak state will get more advantage on the battlefield, which will disturb the balance of power in the international system. In many regions of the world, the US and China are in constant struggle to maintain their autonomy, and autonomous weapons are the core tools to support their adventure in these places, so this regional conflict will be a flash point for total war between the US and China. It will also disturb the peace of regional states. In policy structure there is no such mechanism to control use

of these technologies in warfare. Examine the contemporary characteristics of the US-China relations, the contested territories like South China Sea and Taiwan and the recognized military strategies. It is important to make an assessment on the potential implications of autonomous weapons on regional security especially in the context of the Asia-Pacific where both the US and China are active

Current Incidents, analyze other recent events involving autonomous systems, for example, drone attacks or the interactions of unmanned vehicles, to draw conclusions about their effects on strategic stability. To comprehend the official stance of both nations regarding autonomous weapons and their use in wars, we have examined a brief conceptual analysis of the strategic documents of the US Department of Defense and the Chinese People's Liberation Army, including white papers and military doctrines, which indicate that, highly investment on AW will create new challenges in future and arm race between both superpowers.

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