



Universidade de Évora - Escola de Ciências Sociais

Mestrado em Relações Internacionais e Estudos Europeus

Dissertação

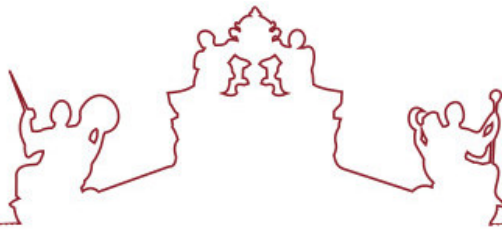
**The beginning of Artificial Intelligence arms race: A
China-U.S.A security dilemma case study**

Carlos Miguel Branco Sandels

Orientador(es) | Marco António Martins

Évora 2019





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A dissertação foi objeto de apreciação e discussão pública pelo seguinte júri nomeado pelo Diretor da Escola de Ciências Sociais:

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Abstract

This dissertation seeks to contribute to a better understanding of the behavior of states when in dispute for global hegemony. However, in this work, the states being studied are China and the U.S.A together with their global dominance in Artificial Intelligence technology. Additionally, considering the rise of China as a superpower, threatening in displacing the U.S.A unipolar supremacy; its ambitions to become in 2030 the global leader in Artificial Intelligence, the purpose of this study is to examine if whether or not an arms race will or is occurring between these two actors due to the rise in the developments of a new military technology – autonomous weapons. In order to answer this hypothesis, the selected methodology in this study is based on a realism theoretical approach, focusing on an empirical case study research, with an historic comparative perspective. Following and examining previous and recent academic studies in this field, findings present reasonable evidence to believe that an arms race is occurring. The question is if these sovereign states will be able to overcome the dangers of the security dilemma, which may lead to conflict.

Keywords: Artificial Intelligence, Autonomous Weapons, Arms Race, China-U.S.A, Geopolitics.

Resumo

Esta dissertação, procura contribuir para uma melhor compreensão do comportamento dos estados, quando em disputa pela hegemonia global. Contudo, neste trabalho, os estados soberanos a serem estudados são a China e os EUA, juntamente com as suas influências globais em Inteligência Artificial. Adicionalmente, considerando a ascensão da China como uma superpotência, ameaçando o poder dominante dos E.U.A e as suas ambições em tornar-se em 2030 uma potência global em Inteligência Artificial, o objectivo deste estudo é estudar uma possível corrida armamentista entre estes dois estados devido ao surgimento de uma nova tecnologia - armas autónomas. Para responder a esta hipótese, a metodologia aplicada é baseada em uma abordagem teórica política do realismo, com foco em uma pesquisa empírica de estudo de caso com uma perspectiva histórica comparativa. Examinando recentes estudos académicos sobre estes assuntos, os resultados entre a disputa da China e os E.U.A apresentam evidências razoáveis para admitir a ocorrência de uma corrida armamentista. A questão é se estes estados soberanos serão capazes de superar o perigo do fenómeno do dilema de segurança, evitando assim o conflito.

Palavras-Chave: Inteligência Artificial, Armas Autónomas, Corrida Armamentista, China-EUA

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Table of contents

Abbreviations and acronym.....	3
Introduction	4
Chapter I -Artificial Intelligence and Lethal Autonomous Weapons Systems	11
1.1 Artificial Intelligence	12
1.2 Lethal Autonomous Weapons Systems.....	14
1.3 Semi-Autonomous weapons	16
1.4 Autonomous Weapons and its impacts.....	20
Chapter II - China´s global influence: the rise of a superpower.....	26
2.1 .China´s authoritarian regime – a sharp power.....	27
2.2 China´s economy – an economic super power	31
2.3 China´s military power and geopolitical influence.....	33
2.3.1 China´s Foreign Policy and Role in the UN Peacekeeping after the Cold War	36
2.4 China´s Belt and Road Initiative	37
2.5 China´s Space Program.....	39
Chapter III - Cold War: former global dispute for hegemony.....	41
3.1 Cold War - The beginning and different stages	42
3.2 Cold War - Nuclear Arms Race.....	43
3.3 U.S.A–USSR military expenditure - The definition of an arms race.....	45
3.4 Space war between U.SA and USSR.....	47
4. Chapter IV - China- U.S.A Technological War: dispute for dominance	49
4.1 Thucydides Trap – China and U.S.A.....	50
4.2 China- U.S.A relations	53
4.2.1 U.S.A and China Military Expenditure	56
4.4 U.S.A -China AI race	58
4.5 AI race and AW developments.....	61
4.6 Drivers for China´s developments in AI from US perspective	63
4.7 China and U.S.A perspective on AI developments – problems and concerns	66
4.9 U.S.A Third Offset Strategy – Plan for competition	67
Conclusion.....	69
Bibliography	70
List of figures	87
List of tables	87

Acknowledgements

To start I would like to express my gratitude to the prestigious Évora University for accepting my enrollment in the International Relations and European Studies Master's program. A special thanks to all my tutors during my master's studies and, of course, to my dissertation supervisor, Prof. Dr. Marco António Batista Martins, for his support, unique expertise and encouragement. Furthermore, I must not ignore by all means the daily repeating reminders of my friend Luís Bruno with the purpose to encourage me to keep working on my dissertation. Luís Bruno has also generously offered me to stay in his private premises (in Évora) whenever needed, together with his partner Nélia and his parents, Maria and António, who have hosted me as a family member. Without you, my master's graduation wouldn't be possible. Thank you. I would like to thank my friends Vasco, Saida, Dragan, Menno, Jacobus, and Álvaro for their friendly and motivational support. To my friend Nick, thank you for your support, advice, and analysis when sharing and discussing global foreign affairs articles. Your knowledge, motivation and expertise have been always an inspiration. Last but not least, I would like to share my gratitude to my parents for their unconditional love and support. You are the reason of my existence and happiness. To the best mother in law in the world, Katie, thank you for your genuine and remarkable support. Special thanks, to my in laws, Isabelle and Raymond for their love and bringing to this world my beautiful nephews, Dean and June. Finally, I want to thank my amazing and beautiful wife Sabine, for standing beside me, even in the most difficult moments, for supporting and believing in me. You are the core of my happiness. Without you, my life would be meaningless.

Abbreviations and acronym

AI	Artificial Intelligence
AW	Autonomous Weapons
AWS	Autonomous Weapons Systems
BRI	China's Belt and Road Initiative
BRICS	Brazil, Russia, India, China, South Africa
CCW	Convention on Conventional Weapons
DARPA	Defense Advanced Research Projects Agency
ESA	European Space Agency
FAW	Fully Autonomous Weapons
GDP	Gross Domestic Product
IR	International Relations
LAWS	Lethal Autonomous Weapons Systems
MENA	Middle East and North Africa
NASA	National Aeronautics and Space Administration
OBOR	One Belt One Road
PLA	People's Liberation Army
PPP	Purchasing power parity
PRC	People's Republic of China
SAW	Semi-Autonomous Weapons
SIPRI	Stockholm International Peace Research Institute
UN	United Nations
UAVs	Unmanned aerial vehicles
USSR	Union of Soviet Socialist Republics
U.S.A	United States of America
USDOD	United States Department of Defense
WW2	World War 2

Introduction

International Relations (IR) is a complex field of study. In fact, one of the biggest challenges for any researcher, or scholar, to understand this branch of political science is the behavior of states and actors involved. However, there is the danger that must not be ignored, which is the unpredictability of how states and the political leaders in charge may react, towards other actors, resulting in possible consequences, such as war. For this reason, IR represents an important role in the world, as it seeks to understand the origins of warfare and the maintenance of peace.

Battles and wars have been always part of human history that has led to the loss of millions of lives¹. In result, in order to restore and maintain peace at all costs, peace treaties have been signed along history but many failed to restore it. However, except one – the Treaty of Westphalia.

The significance of this treaty, signed in 1648, is not only because it ended the Thirty Years War² in Europe, but it established, for the first time, the nation-state concept known as the Westphalia Sovereignty³ and it marks the beginning of the modern international system. Ever since, together with the European influential power around the world, Westphalia principles and sovereign states became a core principle to the maintenance of peace and security. Ever since, direct conflict between major powers, between 1648 and 2015, has decreased⁴.

Additionally, since the end of World War 2 (WW2), the world has experienced a period of 74 years in history where no great powers have been

¹ (Roser,2019). Between year 1400 and 2000, in figure Global deaths in conflicts, more than 20 major conflicts have been reported.

² (Kilsdonk,2018).

³ (Hayman and Williams,2006).

⁴ (Roser,,2019). Percentage of years in which the 'Great Powers' fought one another, 1500-2015

involved in direct conflict⁵. However, since then, proxy wars have been the new scenario of conflict between superpowers. With the end of WW2 –the United States of America (U.S.A) and the former Union of Soviet Socialist Republics (USSR) emerged as super powers, leading to the beginning of the Cold War. What was particular in this conflict is that it marks the first time, where two nations, with different political values, shared one common technological tool capable to destroy the planet - nuclear weaponry. Due to the fear of the real intentions of the opponent, these nations ended in an inevitable race for the development of better military capabilities. In result, these nations were dragged into the classical security dilemma event. The question was whether these nations where to be triggered to start a nuclear holocaust.

While the world was experiencing an era of bipolarity dispute for hegemony and expecting the worse, the Cold War ended with the fall of the Berlin Wall, in 1991. Ever since, the international system has only seen one nation that has been able to thrive and expand its economic, political, military and cultural supremacy - the U.S.A. Known as the 'American Century'⁶, this period marks the global hegemony dominance of the U.S.A between the end of the 20th and beginning of the 21st century.

Nonetheless, some researchers believe, that the American era is coming to an end⁷, with the new rising power that is emerging – Peoples Republic of China (PRC).⁸.

⁵ This period is known as the 'Long Peace'. This cycle marks the longest peaceful period in relations among super powers. A term coined in 1986 by John Lewis Gaddis.

⁶ (Nye Jr, 2015). A term coined in 1941 by Henry Luce.

⁷ (Ikenberry, 2008).

⁸ In this work PRC shall be also referred as China.

The rising of China and its capability to become a superpower has called the attention of academics in many fields. Some even have identified and attributed this event as the 'Chinese Century'⁹.

The reason for China's growth in becoming so debatable is due to its fast extraordinary economic, political and military influence around the globe. For instance, in terms of economic perspective, China is already the second-largest global economy¹⁰, and predictions foresee that it will become the world's largest economy by 2030. In terms of geopolitical perspective, China in 2013 presented its 'Road and Belt Initiative' (BRI), also known as the 'One Belt One Road' (OBOR).¹¹, consisting in a land corridor and a maritime route that connects China with the rest of the world. This initiative, as raised the attention to many researchers, as they see this plan as a new geopolitical strategy for China to expand not just its economic cooperation, but as well a way to promote its influence around the globe¹².

Concerning military goals and developments, China has not gone unnoticed. In fact, since 2002, Chinese political leaders, including President Xi Jinping have stated a long term strategic goal for the first two decades of the 21st century known as the 'period of strategic opportunity'¹³. This period, as per the Chinese government, comes with the purpose to develop and expand China's influential power. Leading edge technologies have been also presented as China's ambitious plans to reach global leadership in Artificial Intelligence with the "Next Generation

⁹ (Powell, 2013). Chinese century refers to the power shifting that is being predicted to occur and to be dominant during the 21st century where China is the main ruling actor. These predictions are based on China's global geopolitical influence and economic growth that is capable to displace the U.S.A unipolar supremacy.

¹⁰ (Woetzel et al,2019).

¹¹ (Koboević, Kurtela and Vujičić, 2018,p11).

¹² (South China Morning Post, 2018).

¹³ (The Department of Defense, 2018).

AI Development Plan”¹⁴. One of the reasons why AI has become China’s main goal is due how much this technology contributes to the development of state of the art autonomous systems and weapons¹⁵ . Furthermore, AI also offers the chance for China and the U.S.A to pursue their influential national and global power within abroad its borders by pursuing systems capable to achieve accurate, military surveillance and possible espionage results¹⁶.

Considering a realist approach, the U.S.A fear in being displaced by China, it is important to highlight the behavior of states from a theoretical realist perspective resumed in three main principles: statism; survival; and self-help).¹⁷ . For these reasons states will do what is necessary to maintain maximum secrecy of their strategic intentions and, goals in order to protect their national security. Nonetheless, considering the Thucydides idea that international politics is driven by power and Rousseau’s concept of the anarchical system that promotes fear, jealousy, suspicion, and insecurity¹⁸, rivalry secrecy leads to some sort of unpredictable dilemma about the real intentions among states that builds a three-stage dilemma: fear – arms race – war.

For this reason, and taking into consideration the U.S.A, a ruling power, in being displaced by China’s rise, should we consider that we heading to a new great powers dispute for hegemony and technological supremacy? Additionally, it reasonable to consider Artificial Intelligence to be the new technology capable to spark an arms race as nuclear technology was during the Cold War?

¹⁴ (Congressional Research Service, 2019,p.19).

¹⁵ (Military and Security Developments Involving the People’s Republic of China, 2019,p.101).

¹⁶ (Ahmed et al,2018).

¹⁷ (Baylis, Smith and Owens, 2017,pp.109-111) For realists, three main theoretical principles must be considered in order to properly define the essence for the behavior of states. First, for realists, *statism* refers that a state is the main actor in international politics and sovereignty is a state main goal. Secondly, *survival* refers to the exclusive vital interest of a state to survive. Thirdly and finally, the principle *self-help* refers to the possibility of war to be an option for a state to engage due to the fact that in the international system there is no higher authority to prevent the use of force.

¹⁸ (Baylis, Smith and Owens, 2017,p.103)

Considering these questions a further hypothesis examination has been conducted, and resumed in three hypotheses leading to my main research question:

- i. China's goal to become A.I global leader in A.I in 2030 a driver for security dilemma.
- ii. China-U.S.A initial arms race in Autonomous weapons – a security concern.
- iii. The drivers for a race in autonomous weapons are related with the Cold War arms dispute.

Main research question: Are we heading to an era of autonomous arms race?

In order to defend my main research question, I have decided to follow a realism theoretical approach and the selected methodology to be used will be focusing on an empirical case study research with a comparative analysis.

The reason why I have selected this methodology and research design is that realism considers that human evolution is determined based on historical events, and not on human will. With this said, this means that history bounds to repeat itself, therefore allowing us to foresee future events.

Furthermore, in order to conduct a proper examination, with the purpose to answer my research question, my work is divided into four chapters:

In Chapter I, the reader shall be introduced to one of the main topics of my study- Artificial Intelligence and Autonomous Weapons. Since, the end of the Cold War, the world has not seen any dangerous military technology, except nuclear

weapons. However, the 21st-century promising technology seems to be AI. This technology is proving that is capable to reshape global order, and for this reason, superpowers have declared officially their interest, in particular, autonomous systems within the military scenario. For this reason, and considering China's developments, and battle for AI preeminence between the U.S.A, which recalls the nuclear proliferation events during the Cold War, the topic for this chapter has been selected. One of the questions that this section intends to withdraw is how much will AI reform the concept of warfare, and strategy leading to serious implications towards defense and security. In other words, this section intends to conduct a gradual approach on how AI development can be observed as a potential driver for the dispute in global superiority.

Chapter II intends to withdraw the attention of the reader about the characteristics of China as a rising power. China's authoritarian regime, economic, military, and geopolitical influence such as China's Belt and Road Initiative and China's Space Program are further topics to be discussed. The relevance of this section is that it demonstrates China's commitment to regain its dignity and sovereignty after the "Century of Humiliation"¹⁹. With this section, the reader should be more acquainted about the behavior of a state when emerging as a superpower, and what are the fundamental pillars to consider it as such.

In Chapter III, several stages such as proxy wars, space exploration, and nuclear arms race that occurred during the Cold War (in particular arms race) shall be examined in order to identify and understand the challenges, and dangers that occurred in this period. The Cold War arms dispute has been presented with the purpose to introduce the reader the gradual military and technological

¹⁹ (Rosenberg, 2017).Period between 1839-1949, that refers to the end of China's nearly 1000 years empire due to the Western powers dominance.

developments, causes and effects that are implied to also coexist between China and the U.S.A. In other words, this chapter explores the challenging and developing stages of the relation between superpowers when confronted with global dominance. A further reason for the selection of the topic, in this chapter, is because it represents the dangers towards peace and challenges towards military strategy when two superpowers hold the most advanced, and dangerous technology, while in simultaneous dispute for global dominance.

Chapter IV focuses to explore the questionable Sino-US relations. China- U.S.A global rivalry has been carefully selected to be examined, as it represents, a classical phenomenon, in the field of International Relations, and Strategic Studies, when it comes to global power dispute. Considering the threat of a rising power, in displacing a ruling power, and the unpredictability behind the gradual stages of economical, geopolitical and military developments, the problem that this brings is not just about identifying similar patterns between this 21st period of global dispute that existed during the Cold War, but as well the dangers and consequences that may occur. China's growth and its impacts on the U.S.A indicate a strong rivalry between these 2 actors, representing a global threat to peace and security. In fact, this rivalry has already shown some signs of escalations, such as, recent events - the Trade War, Space War, and AI competition. This events, show a clear demonstration of the dispute for global power distribution. For this reason, this chapter is important, in my belief, as it provides a better acquaintance of the relations between two main actors of this study.

The aim of my research is not to conclude what is right or wrong, but rather to be able to identify strengths, limitations, and as well to help readers and scholars to have a progressive knowledge about the strategic military dangers and challenges between states when competing for global preeminence.

Additionally, this study aims to contribute for International Relations students and scholars a better understanding of the impacts of a rising power, towards a ruling power, together with the rise of a new technology that will provide states a chance to achieve, and maintain their global superiority. Another contribution goal of this study is to highlight the economic, political, social and cultural challenges that the world may experience in the next decades. Finally, this study also aims to help NGOs, government and private sector researchers how to address contemporary challenges such as: global dispute with the rise of new technologies capable to reshape the art of warfare and military strategy, and the dangers that these represent towards peace and security.

Chapter I -Artificial Intelligence and Lethal Autonomous Weapons Systems

Artificial Intelligence has demonstrated the power to transform the idea that the general audience has on military systems and warfare. One of the extraordinary technological achievements that AI has contributed within the military scenario is the development of autonomous weapons and systems. In fact, these technologies are no longer a science fiction subject if we consider autonomous drones' aka killer robots that have been already successfully put to test. Despite the astonishing advances, with regards to the autonomy that AI allows to be introduced to military weapons, and systems, the problem is that this raises several questions concerning the implications towards defense and security as it allows states, to enhance, their superiority towards the rest of the world. Therefore, considering these events and possible implications, this chapter has

been included in my study to offer an introduction of one the main topics of my research – Artificial intelligence, autonomous weapons and systems.

1.1 Artificial Intelligence

Once a topic of science fiction, Artificial Intelligence is now embedded in our society and in government's agenda. With its first origins in definition by John McCarthy of Massachusetts Institute of Technology in 1956²⁰, Artificial Intelligence can be defined as a system that it is able to analyze and take actions in an intelligent autonomous behavior²¹. Nevertheless, the definition of this term may require a far more detailed definition due to the vast complexity of the systems behind such technology. For instance, AI can also be defined as branches of computer science that its main goal is to create intelligent machines that are capable to work and react like humans²². In other words, AI is a computer system capable to perform reasonable and behavior tasks like humans. Some of these tasks are: knowledge, reasoning, problem solving, perception, learning, planning, and the ability to manipulate and move objects²³. In fact these simple AI task are already assisting our lives in many day to day activities such as: web searching, social media, email communications, stores and services, and offline experiences²⁴.

Furthermore, voice assistants, image analysis software, and speech and face recognition systems, hardware devices such as advanced robots, autonomous vehicles, drones or internet of thing tools²⁵ are additional AI technological capabilities that are responsible in the way of how society is living.

²⁰ (History of Artificial Intelligence, Council of Europe, 2019).

²¹ (European Commission, 2019, p.1).

²² (Habeeb, 2017).

²³ ibid

²⁴ (Bradley,2018).

²⁵ (Delponte, 2018,p.12).

AI is also playing an important role in people's daily activities. Nonetheless, despite the advantages of AI in society, governments see this technology as a tool capable to reshape the balance of power²⁶.

In fact, since 2016, AI has been identified as an emerging and disruptive technology at Senate Select Intelligence Committee's annual hearing²⁷. For this reason, policy makers and experts have stressed how much this technology can help a nation to obtain its technological, economic and security supremacy²⁸.

AI is also predicted to trigger a new industrial revolution - the 'Fourth Industrial Revolution'²⁹ which the U.S.A and China are already competing for the raw material that is the main core of AI -Big Data³⁰.

For this reason, AI appears to pose a threat to humanity which policy makers expressed their concerns, and thus three global policy challenges stand out³¹:

- Measure the current and future applications of AI in cyber security and the military.
- Address the risks of an uncontrolled international AI races.
- Maintain AI research safe and beneficial to humanity.

Another concern that AI out brings is its capability in conceiving a new era of digital espionage which alerts the severe consequences for any state's national security³². In fact, this concern has been also indicated to be possibly carried out

²⁶ (Suder,2018).

²⁷ (Congressional Research Service, 2019,p.19).

²⁸ (Delponte, 2018,p.9).

²⁹ (World Economic Forum, 2019). *The Fourth Industrial Revolution, by Klaus Schwab*. The 'Fourth Industrial Revolution', a term coined by Klaus Schwab, refers to the adoption of cyber physical systems which will allow machines to interact autonomously in private and working environments. In other words, machines capable to have autonomous capabilities will exist and replace many complex and delicate tasks that for long only humans could do.

³⁰ (Delponte, 2018,p.9).

³¹ (Delponte, 2018,p.30).

³² (Congressional Research Service, 2019, p.22). Artificial Intelligence and National Security.

due to the AI autonomy that decreases the number of humans required in specific tasks in the cyber domain such as espionage³³.

Another concern, within researchers (Scott, Heumann and Lorenz, 2018), is the danger that AI poses towards military systems and decision making as it will weaken existing approaches for conflict containment, and de-escalation.

For this reason, AI seems to be a technology capable to reshape distinguished sectors of our daily activities, for good, but also for the worse. In particular, if we consider the challenges that this technology poses within the government, and military perspective that involves defense and security. The question is, whether states and policy makers will be able and be interested to analyze the challenges and danger of AI.

1.2 Lethal Autonomous Weapons Systems

Since the end of the Cold War, the world as experienced a peaceful relief towards the imminent nuclear threat that no one seemed to expect less the worse. However, a new military advanced technology is rising due to rapid and advance developments in AI - Autonomous Weapons Systems (AWS), or also indicated in this study as Lethal Autonomous Weapons Systems (LAWS). LAWS poses a major threat to defense and security all around the world, as it is believed that states that are developing LAWS are not able to prevent proliferation, which over time, could result in a global arms race³⁴.

But what are LAWS? Although the uncommon definition of LAWS these systems are argued to be weapons that can autonomously select and engage

³³ (Allen and Chan, 2017, p.18).

³⁴ (Jacobson,2017,p.3).

targets³⁵. There is no clear recognition that LAWS should also include semi-autonomous weapons as well there is no indication that fully autonomous weapons are already employed by militaries³⁶. Notwithstanding, LAWS seem to be a developing used technology³⁷. Gradually evolving from semi to full autonomy, LAWS rapid technological developments and achievements is a clear sign that the classical idea the international system has on warfare may be promptly outdated, if not already it is. In particular, if we see how LAWS offer the option to whether augmented soldiers or even replace them in the battlefield³⁸. However, LAWS do not only exist and but also are being developed for lethal purposes even within the military scenario. In fact, these autonomous systems are, for instance, enhancing safety for soldiers whether on the ground, air and sea by offering a free from harm approach in missions that require reconnaissance, surveillance and transport/supply action³⁹. These systems are known as unmanned vehicles (UV's). However, it is important to alert that many of these systems are not yet fully autonomous; instead, they still require human intervention. One of the main reasons for the need of human interaction in these systems lies on the complex environments and tasks involved⁴⁰. However, the greater the complexity of a certain technology the greater the risk involved⁴¹.

³⁵ (Jacobson,2017,p.2).

³⁶ *ibid*

³⁷ *ibid*

³⁸ (Petman, 2017,p.17).

³⁹ (Technology Development for Army Unmanned Ground Vehicles,2002).

⁴⁰ (ICRC, Autonomy, artificial intelligence and robotics: Technical aspects of human control, 2019)

⁴¹ *ibid*

1.3 Semi-Autonomous weapons

Existing in various forms over 70 years, semi-autonomous weapons systems are weapons with limited autonomy. Nonetheless the engagement and destruction of a specific target still are restricted by human conscious decision⁴². Providing intelligence gathering, surveillance and reconnaissance, this autonomy can be seen present in fire-and-forget munitions, loitering torpedoes, and intelligent antisubmarine or anti-tank mines⁴³. Semi-autonomous weapon system is also referred to as human 'in-the-loop'⁴⁴. Despite the location of the human control and the machine may be different, human 'in the loop' refers to the control of the machine even remotely⁴⁵. Nevertheless, as per some academics, the development of semiautonomous weapons are secretive, therefore, is uncertain how much human control is involved leading to a dangerous environment of the unknown capabilities and dangers of these systems⁴⁶. Some of these 'semi-autonomous' systems and weapons that are rapidly being developed and deployed is rising concerns. In the U.S Air Force, within the unmanned aerial vehicles (UAVs), various applications are being applied for reconnaissance / surveillance purposes, attack, transport, and /or especial applications. One example of a surveillance and attack UAV is the X-47B. This strike fighter uninhabited aerial vehicle is programmed to take off and land on an aircraft carrier without intervention by a human pilot⁴⁷. Developed by Northrop Grumman, X47-B had its first flight test in, February 2011, and its second on an onshore catapult facility at Naval Air Station Patuxent River in

⁴² (Center for a New American Security, 2016,p.8).

⁴³ (Petman, 2017,p.19).

⁴⁴ (International Committee of the Red Cross, 2014,p.14).

⁴⁵ (Van Est et al, 2017, p.16).

⁴⁶ (Del Prado, 2015).

⁴⁷ (X-47B Unmanned Combat Air System, n.d.).

November 2012, and is expected to enter active naval service by 2019.⁴⁸ With a wingspan of 62.1ft and 38.2ft-long, X47-B is designed for stealth or low observable relevant requirements. Furthermore, X47-BT computer systems are intelligent and its flight control system is autonomous⁴⁹. In 2015, the X-47B conducted the first ever Autonomous Aerial Refueling of an unmanned aircraft.⁵⁰ Additionally, in 2019, the U.S Air Force unveiled their high subsonic, long range combat drone – the XQ-58A Valkyrie⁵¹. Following the U.S.A technological achievements, China as also demonstrated their strong capabilities within the AUV field, with their first successful UAV preflight, in 2013, with the Hongdu Lijian - Sharp Sword⁵². Additionally, within the private sector China's developments in AUVs seems to be building their supremacy with the development of Fei Long-2, Fei Long-71;CH-7;Star Shadow; Tian Ying and XY-280⁵³.

Within the Army, both nations have also unveiled their latest developments in semi-autonomous systems capable to perform several task such as reconnaissance; explosive disarmament; search and rescue; logistics support; fire support; lethal combat roles and much more⁵⁴.

One of the first deployed unmanned vehicles (although not an autonomous system). for a reconnaissance purpose is the Dragon Runner. Manufactured by a North American company and into force in 2003, the Dragon Runner was developed for urban operations, and army troop inaccessible environments. Measuring around 23cm in length, 20cm wide and 7.5cm tall with a weight of

⁴⁸ ibid

⁴⁹ ibid

⁵⁰ (Northrop Grumman,2019,n.d).

⁵¹ (Rempfer, 2019).

⁵² (Ng,2019).

⁵³ ibid

⁵⁴ (SOFREP,2019).

about 14lbs⁵⁵the Dragon Runner is s powered by military batteries, and controlled by a soldier from a safe distance, through the robot's onboard 6 cameras⁵⁶. One of Dragon Runner's contributions within the military scenarios has been in Afghanistan by helping troops in disarming roadside bombs, enhancing perimeter and checkpoint security and the inspection of suspect vehicles⁵⁷. The importance in enhancing this technology is that it marks the use of robots in warfare scenarios. As the technology evolves the same does the autonomy in the systems. Within unmanned ground vehicles, China 's Sharp Claw 2 is one of them. Able to perform particular actions independently or together with soldiers, Sharp Claw 2, is a Chinese auxiliary ground unmanned vehicle that within the several features that it contains, autonomous path tracking based on digital map is one of them⁵⁸. On the other hand, the U.S.A, as also disclosed its Multi-Unmanned Tactical Transport (MUTT)⁵⁹. Designed to carry out pounds of extra equipment, and able to follow soldiers in battlefields, one of the particular features of the MUTT is its Precision Remotes T360 Stabilized Weapon Station. Semi-autonomous systems and weapons come in many forms as they both are being combined and already deployed in warfare scenarios as ground unmanned vehicles. Another type of these semi-autonomous systems with firepower purposes are the armored fighting vehicles such as tanks. In fact, as per Lin and Singer (2014), China is introducing modern technology into their old ZTZ-59 tanks which allows them to be operative without a human driver. Such autonomy in tanks has been also introduced by Howe & Howe, Textron Systems, and FLIR Systems with the Ripsaw M5 Robotic Combat Vehicle (RCV).⁶⁰. Exhibited in 2019, the Ripsaw M5 is an unmanned light tank

⁵⁵ (Army Technology, n.d).

⁵⁶ *ibid*

⁵⁷ (Army Technology, 2009).

⁵⁸ (Army recognition, 2016).

⁵⁹ (Precision Remotes,n.d).

⁶⁰ (Army Technology n.d).

suitable for all terrain conditions⁶¹. Finally, within the Navy, semi-autonomous maritime systems and weapons have been also introduced. These systems come also in various forms such as submarines, vessels and even underwater drones⁶². Unmanned surface vessels range from the big Sea Hunter to smaller systems such as Aqua Quads or Wave Gliders⁶³. The Sea Hunter, for instance, is a DARPA prototype that completed its testing in 2018. Once into service, it's expected to offer the U.S Navy to autonomously navigate the open seas, coordinate missions with other unmanned vessels and providing submarine-hunting coverage⁶⁴. Another estimated advantage of the Sea Hunter is its daily \$20,000 costs in contrast to around \$700,000 for a traditionally inhabited destroyer⁶⁵. On the other hand, China as also unveiled their latest maritime unmanned such as the JARi-USV. Unveiled in 2018, the JARi-USV besides its stealth technology and being remotely controlled, one technology, in particular, is the AI system that allows this vessel to autonomously navigate and undertake combat activities⁶⁶.

In essence, semi-autonomous systems are a living proof technology that is embedded in society, in particular within the military sector, allowing states to reform their defense and security system. However, the advances that are being made in the developments of autonomy are allowing machines to have full autonomy as well⁶⁷. The question is how much this technology will change a warfare scenario. When military innovations such as firepower, or armored vehicles, and vessels were introduced, they did not completely replace humans in

⁶¹ *ibid*

⁶² (Congressional Research Service. Artificial Intelligence and National Security 2019.p.14)

⁶³ (NATO,2019)

⁶⁴ (Congressional Research Service. Artificial Intelligence and National Security 2019. p.14)

⁶⁵ *ibid*

⁶⁶ (Navy Recognition,2019).

⁶⁷ (Precision Remotes,n.d).

the battlefields, however many human tasks have and will be at the risk to become obsolete in a near future.

1.4 Autonomous Weapons and its impacts

Although there is no international agreed definition of an autonomous weapon, these are defined as weapons that can independently select and attack targets⁶⁸. On the contrary of semi-autonomous weapons, autonomous weapons are what it refers to when the machine works autonomously, .i.e. where human control is 'out of the loop'⁶⁹. Autonomous weapons are also colloquially known as 'killer robots'⁷⁰.

However, due to the challenges and dangers that this technology is capable to threaten security, European states and various EU institutions, are including AWS on the agenda of the United Nations Convention on Certain Conventional Weapons (CCW), since 2013⁷¹. Considering the development and use of these autonomous systems this brings several concerns such as the potential for this technology prevailing in warfare and the unpredictability of the technologies employed that may lead to the inability to attribute culpability and accountability⁷².

For this reason, AWS have been highlighted on a signed historic letter from artificial intelligence and robotics researchers⁷³. The debate about AWS impacts has gained fresh prominence within the scientific community highlighting awareness in 2017⁷⁴:

⁶⁸ (International Committee of the Red Cross, 2014,p.15).

⁶⁹ (Van Est et al, 2017, p.16).

⁷⁰ (Garcia,2016,p.94).

⁷¹ (Kayser and Beck, 2018,p.1).

⁷² (Garcia,2016,p.96).

⁷³ (Future of Life Institute, n.d.).

⁷⁴ *ibid*

“Lethal autonomous weapons threaten to become the third revolution in warfare. Once developed, they will permit armed conflict to be fought at a scale greater than ever, and at timescales faster than humans can comprehend.”⁷⁵

Additionally, with the purpose to address the impacts of the main core of Autonomous Weapons - Artificial Intelligence, which enables machines to operate without human intervention or control, several European states have stated their concern and views towards this technology. Nevertheless, some states such as the Netherlands indicated that autonomous weapons may be a key aspect to the military advances as this may bring better accuracy and efficiency resulting in the reduction of human lives⁷⁶. Furthermore, at the United Nations, in Geneva, April 2018, a global coalition of non-governmental organizations and the participation of 84 countries (including China and the United States of America). held a meeting as a result from the Campaign ‘Stop Killer Robots’ with the purpose in calling all states to⁷⁷:

- Fully commitment in the negotiations of a legally-binding ban treaty to evaluate draw the boundaries of future autonomy in weapon systems;
- Necessary specifications on human control when required over critical functions;
- Implementation of national policy and legislation to prevent the development, production, and use of fully autonomous weapons;

⁷⁵ ibid

⁷⁶ (Kayser and Beck, 2018,p.19).

⁷⁷ (Campaign to Stop Killer Robots,2018,p.3).

For the first time, in willing to negotiate and conclude, a new CCW protocol to prohibit the use of fully autonomous lethal weapons systems, China has expressed the supports in banning the use of fully autonomous weapons, however, not the development or production⁷⁸. On the other hand, twelve countries (including the United States of America), have rejected any interest to negotiate new international law on fully autonomous weapons⁷⁹.

Considering that China has expressed a higher concern than the United States of America this raises a concern in regards to the distinct political agenda of these two nations. These events provide further support for the hypothesis that autonomous weapons, such as killer robots, may lead to a global arms race capable to reshape the concept of battlefield⁸⁰. These military technologies armed drones and other autonomous advanced weapons are being indicated to be more commonly tested and used by high-tech militaries, including the U.S.A and China⁸¹.

For example, in 2017, a video released by the USDOD gives a brief look of a 103 mini drones swarm test-launched, in October 2016, by F-18 fighter jets, known as the Perdix Swarm Demonstration⁸². The Perdix Swarm Demonstration has been stated by Secretary of Defense Ash Carter that this type of technology will provide the U.S.A dominance towards its adversaries but as well it represents a driver for the development of AWS⁸³. Following the U.S.A Perdix demonstration, China is also involved in several experiences such as the Skywalker (see figure below). On the other hand, China has also been proving its ambitions and supremacy in this technology from the civil

⁷⁸ *ibid*

⁷⁹ *ibid*

⁸⁰ (Perrigo,2018).

⁸¹ *ibid*

⁸² (Perdix Swarm Demonstration, 2017).

⁸³ *ibid*

perspective, implying that these two nations are engaged in a game of drones. In 2018, E Hang⁸⁴, world’s leading autonomous aerial vehicle (AAV), technology platform company set a world Guinness record by “swarming” 1374 drones in the city of Xian⁸⁵.

Nonetheless, as per tables below, the rivalry between PRC and U.S.A concerning the size of drone swarms goes back from the year 2015 within military successive records and 2016 within civil successive records.

Table 1: Successive records for size of swarm of fixed-wing UAV (all military).

DATE	NUMBER OF UAV	DEVELOPER	STATE	TYPE
04-2015 ²³	30	US Navy	US	Coyote
09-2015 ²⁴	50	US Navy	US	Coyote
11-2015 ²⁵	67	CETC	China	Skywalker
12-2015 ²⁶	103	US DoD	US	Perdix
06-2017 ²⁷	119	CETC	China	Skywalker
04-2018 ²⁸	200	CETC	China	Skywalker

Source: David Hambling, Change in the air Disruptive Developments in Armed UAV Technology, 2018. <http://www.unidir.org/files/publications/pdfs/-en-726.pdf>

A further key point to consider and which calls the attention for further debate is the increased amount of 170 UAVs (all military). in just three years’ time but also China’s leadership in this technological sector.

⁸⁴ <http://www.ehang.com/about>

⁸⁵ (Cadell,2018).

Table 2: Successive records for size of swarm of rotary-wing UAV (all civil).

DATE	NUMBER OF UAV	DEVELOPER	NATION	TYPE
01-2016 ³⁵	100	Intel	US	Shooting Star
11-2016 ³⁶	500	Intel	US	Shooting Star
02-2017 ³⁷	1,000	Ehang	China	Egret
01-2018 ³⁸	1,218	Intel	US	Shooting Star
05-2018 ³⁹	1,374	Ehang	China	Egret
07-2018 ⁴⁰	2,018	Intel	US	Shooting Star

Source: David Hambling, Change in the air Disruptive Developments in Armed UAV Technology,2018.
<http://www.unidir.org/files/publications/pdfs/-en-726.pdf>

With nearly an increase of 2000 UAVs, in less than three years, this result also indicates a clear rivalry between China and the U.S.A. Nonetheless, in this sector (civil). the U.S.A seems to be leading actor.

Thus, results indicate that both China and the U.S.A are the leading actors and main rivals when it comes to swarm UAVs. In fact, a prediction that China could be an adaptive, technological sophisticated future force has been stated in 2005⁸⁶. Considering this prognosis and the technological advances since 2015, China in a decade has not just proven its technological efficient developments but as well it demonstrates competence in becoming a competitive rival for the U.S.A preeminence in regards to UAVs.

However, this technological rivalry may trigger concerns regarding the possible outcomes. In fact, drone swarms seem to be an advanced technological

⁸⁶ (Edwards, 2005).

tool that is capable to revolutionize the concept of military affairs, in particular, in China⁸⁷.

In result, theories have been presented with key questions concerning security when considering such swarms of drones fully equipped with missiles or warheads capable to fully engage accurate attacks⁸⁸. In fact, as per an expert on China's military, swarming has been considered to be one of the most promising areas of defense technology development in the world, and China (together with the U.S.A), has demonstrated its commitment to it⁸⁹. Actually, as per Romaniuk and Burgers (2018), in terms of the development of swarm drones, China has strongly demonstrated its achievements surpassing the U.S.A in this area.

One of the drivers for the investment in this sector of autonomous systems such as drones is how much they can influence in the territorial or maritime disputes. For instance, it has been stated that China will seek effectiveness in the delicate South China Sea dispute by investing in unmanned vessels that are capable to deploy aerial drones⁹⁰. This calls into attention the dangers of such deployment and performance. For instance, as per Hambling (2018, p. 9), the dangers of UAV's (unmanned aerial vehicles), is when these vehicles can travel thousands of kilometers to attack high-value targets becoming an imminent threat to national security. AWS and AI have the potential to change the nature of warfare⁹¹. For this reason and considering as well the danger of drones due to their radical influence in conflicts, researchers call into attention to the importance and detailed attention of the developments of such technology as it enhances higher risks in overlooking potential dangers to stability and security around the world⁹².

⁸⁷ (Feng and Clover 2017).

⁸⁸ *ibid*

⁸⁹ *ibid*

⁹⁰ (Chase et al, 2015).

⁹¹ (Congressional Research Service, 2018, p.1).

⁹² (Zwijnenburg and Postma, 2018).

In essence, AI developments and achievements in recent years must not be disregarded and underestimated if we consider the impacts and dangers of this technology. Additionally, if we consider a realist perspective of how much such technology is capable to change the concept of warfare and also how much it represents as an important tool for global influence; concerns arise on how states will be able to overcome the level of proliferation.

Chapter II - China's global influence: the rise of a superpower

The 21st century has been predicted to be the 'Chinese Century'⁹³. Economic, military and geopolitical influential power, seem to be the key elements that are responsible to attribute China's capability to shape the global hegemony in the 21st century and the global recognition of a superpower. The question is what type of superpower can be attributed to China and what are the values that will drive China's role in the world? Following these questions, one of the main goals of this chapter is to study China's global influence in the sphere of foreign affairs in order to help the reader to be more acquainted with the patterns of a rising superpower.

Another important element, to introduce in this chapter, is the attitude and approach of China when pursuing its influence and interest as a superpower. This brings into question, in regards, to the type of power that China is engaging, the effects, and impacts towards the rest of the world. In fact, considering China's authoritarian regime, the type of power that is presented in this chapter is sharp power.

⁹³ (Powell, 2013).

Furthermore, another key element, that must not be ignored, is China's "Century of Humiliation". The importance to highlight this episode is China's response to its historical defeat and humiliation by proclaiming 5 principles that establish their position towards other nations by requesting a noninterference and respect for their territorial integrity and sovereignty suggesting a clear indication of China's commitment to recover its dignity and as well its global influential power⁹⁴.

This chapter intention is to withdraw China's historical geopolitical progress - China's use and development of Artificial Intelligence and its geopolitical status and global influence. In other words, this section aims to investigate, and examine the gradual steps of a rising power and highlight a possible reason to believe that these elements may lead to an increase of a security dilemma for the U.S.A. For this matter, and focusing in a theoretical realism analysis a theoretical question is presented: must China's global dominance be considered as a threat to peace and security. In other words, can China rise peacefully?

2.1 .China's authoritarian regime – a sharp power

One of the most influential elements for a country to prove, and protect its sovereignty is power. Power can be characterized in distinct ways, and over time it has changed as per the new challenges, and values behind each actor's principles and goals. From direct confrontation (hard power), to diplomatic approaches (soft power), power has developed in a way that no longer direct confront is to be the most adequate solution to protect any nation's interests. Considering the distinctive interest and values responsible to shape how power can be engaged,

⁹⁴ (Petras, 2012).

the term sharp power has been suggested⁹⁵ to be the most adequate to attribute it to China.

Coined by Christopher Walker and Jessica Ludwig⁹⁶, the term sharp power refers to the conduct of limited free expression, confusion, and a deceiving political environment within an authoritarian regime, as a result of information warfare.⁹⁷ What this means is that in an era of technological tools that allow people to view and share whether similar or distinct social-political opinions, having control over how information is distributed is a key element for a state to conduct its power.

One example of this strategy, which has raised global concerns, in particular, is China's efforts to control discussion topics in American publications, movies, and schools that involve Chinese national information⁹⁸.

Nevertheless, as per Nye Jr (2018), the manipulation of ideas, political perceptions, and deceptive use of information for hostile purposes and to reduce the attractiveness of democracy, is not a new type of strategy, in fact, it has been also used during the Cold War, by the former USSR.

The only difference between the Cold War, and this era of the Chinese influence, is the current modern technology that is allowing the use of new tools, and techniques. Such techniques are the online censorship system, known as, the Great Firewall, that restricts China's online users, applied machine learning to combine with censorship, and surveillance which will impact global freedom of expression, and selected removal content from global technological platforms such as Google and Facebook⁹⁹.

⁹⁵ (Nye Jr, 2018).

⁹⁶ *ibid*

⁹⁷ (Walker, 2018).

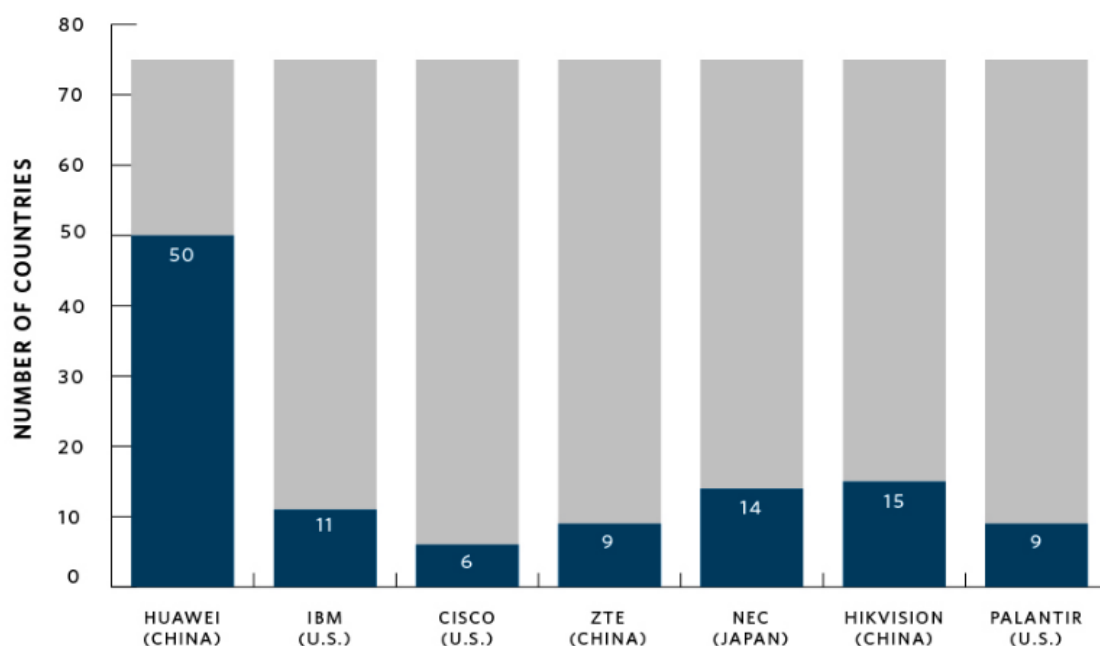
⁹⁸ (Nye Jr, 2018).

⁹⁹ (Walker, 2019).

Additionally, Artificial Intelligence appears to be also a tool to be used as it allows the Chinese Government to develop social management methods such as: the prediction of human behavior, and the collection of human action¹⁰⁰.

In fact, as per Feldstein (2019), the development and deployment of A.I systems for surveillance purposes are increasing, Chinese and also U.S.A companies represent one of the main global developers¹⁰¹.

Figure 1: Leading countries contributing for AI surveillance



Source: Carnegie Endowment for International Peace. Retrieved from: <https://carnegieendowment.org/2019/09/17/global-expansion-of-ai-surveillance-pub-79847>

Smart cities / safe cities, smart policing, and AI surveillance facial recognition are one of the main AI systems being used by governments¹⁰². In the case of facial recognition, the problem is that this type of systems enables the creation of detailed biometric maps of individuals without their consent¹⁰³.

¹⁰⁰ ibid

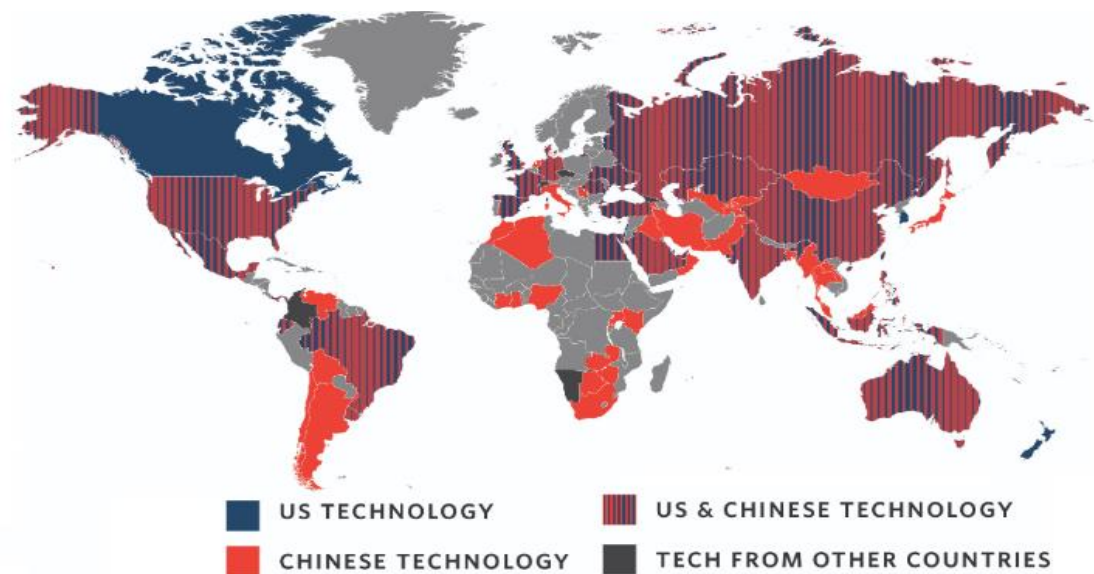
¹⁰¹ (Feldstein,2019).

¹⁰² ibid

¹⁰³ ibid

Another point in question is the proliferation of these systems around the globe. For instance, it has been reported that in 2019, already 65 countries use Chinese AI surveillance systems¹⁰⁴. However, it is implied that one of the drivers for the surge for AI is how much this technology will help to conduct at a low cost the engagement of surveillance, and espionage towards other targets¹⁰⁵.

Figure 2: AI surveillance technology of origin



Source: Whitney Book, 18 pt, sentence case. Retrieved from: <https://carnegieendowment.org/2019/09/17/global-expansion-of-ai-surveillance-pub-79847>

In essence, new surveillance tools are reforming the ability of China (and even the U.S.A), to control individuals and governments, in which AI appears to be one of the main technologies that is not only allowing but rather encouraging the investment and usage of this tool and approach.

In result, due to China's political approach, the values and goals behind it, and accurate results that AI is able to provide, sharp power has been suggested to be attributed to this attitude. Nonetheless, whether or not if the intentions of such

¹⁰⁴ (Feldstein,2019).

¹⁰⁵ (Ahmed et al,2018).

power are to be applied abroad national borders, there is reasonable evidence to an intimidating approach to this sort of approach. The question is how other actors may react. Some states may embrace; other may be against such political and technological views.

2.2 China's economy – an economic super power

Economy plays an important role for national security, as it allows states to invest in their safety and survival. The stronger the economy of a nation, the more it can invest in its technological progress. One of the classical global economic examples of how important a nation's economy is and how it helps to secure, and invest in its national security is the U.S.A's economic power. For more than a century, the USA has been the strongest economy in the world¹⁰⁶. Notwithstanding, the American global economic supremacy seems to be at risk for displacement, as a result of the fast-growing economy of China.

In fact, China, in 2018, became the second global largest economy¹⁰⁷ and in 2014 as managed to surpass the 'Uncle Sam'¹⁰⁸ world's biggest economy in PPP (purchasing power parity), terms and it is estimated to continue holding its preeminence by 2030¹⁰⁹ until 2050 (as per table below).

¹⁰⁶ 2,000 Years of Economic History in One Chart. Retrieved from:
<https://www.visualcapitalist.com/2000-years-economic-history-one-chart/>

¹⁰⁷ (Woetzel et al,2019).

¹⁰⁸ A nickname that defines the United States of America as a country. Retrieved :
<https://www.history.com/this-day-in-history/united-states-nicknamed-uncle-sam>

¹⁰⁹ (Hawksworth and Chan, 2015).

Table 3: GDP at PPP rankings

PPP rank	2014		2030		2050	
	Country	GDP at PPP (2014 US\$bn)	Country	Projected GDP at PPP (2014 US\$bn)	Country	Projected GDP at PPP (2014 US\$bn)
1	China	17,632	China	36,112	China	61,079
2	United States	17,416	United States	25,451	India	42,205
3	India	7,277	India	17,138	United States	41,384
4	Japan	4,788	Japan	6,006	Indonesia	12,210
5	Germany	3,621	Indonesia	5,486	Brazil	9,164
6	Russia	3,559	Brazil	4,996	Mexico	8,014
7	Brazil	3,073	Russia	4,854	Japan	7,914
8	France	2,587	Germany	4,590	Russia	7,575
9	Indonesia	2,554	Mexico	3,985	Nigeria	7,345
10	United Kingdom	2,435	United Kingdom	3,586	Germany	6,338

Source: IMF WEO database (October 2014). for 2014 estimates, PwC projections for 2030 and 2050. Retrieved from: <https://www.pwc.com/gx/en/issues/the-economy/assets/world-in-2050-february-2015.pdf>

With an annual average of 10 % gross domestic growth (GDP), China’s economic growth is seen as one of the greatest economic successful events in modern history¹¹⁰. Identified as a Socialist market economy¹¹¹, the Chinese ‘economic miracle’¹¹² is attributed to two main factors: large-scale capital investment (financed by large domestic savings and foreign investment), and rapid productivity growth¹¹³.

Additionally, a 40 years Economic Reform (1979 – 2017).¹¹⁴, is another factor that is responsible to help China to come out from poor isolation to the biggest merchandise trader in 2013 and up until 2017 it still holds the top position.

¹¹⁰(Congressional Research Service ,2019). -China’s Economic Rise: History, Trends, Challenges, and Implications for the United States.

¹¹¹(Pelkmans, 2018).

¹¹²A term used to define an unexpected rapid economic growth. Retrieved from : <http://www.businessdictionary.com/definition/economic-miracle.html>

¹¹³ (Congressional Research Service ,2019). -China’s Economic Rise: History, Trends, Challenges, and Implications for the United States.

¹¹⁴ (Congressional Research Service ,2019,p.1). - China’s Economic Rise: History, Trends, Challenges, and Implications for the United States.

For this reason, PRC economic growth has not gone unnoticed. In fact, the gap that separated the U.S.A and China's GDP on a PPP basis in 1980¹¹⁵ inverted in less than forty years.

Value-added manufacturing, merchandise trade, and holder of foreign exchange reserves are some additional China's economic achievements¹¹⁶. Another particular and relevant accomplishment that China has made in last years, that must not be ignored, is its global force in the digital economy and artificial intelligence (AI), technologies, which is already in some technologies the largest consumer¹¹⁷.

China in the last decades has managed to achieve the characteristics that suggest its international influence, and dominance from an economic perspective. The question is whether or not it will be able to become the strongest economy despite the predictions that support this to occur in less than a decade.

2.3 China's military power and geopolitical influence.

The year 2015, marks China's military ambition to compete with the U.S.A military with President Xi Jinping disclosing the People's Liberation Army (PLA), 30 years reform¹¹⁸. Known as the 'period of strategic opportunity', China commitment to increase its military power has become a main goal with the purpose to develop expand its national power¹¹⁹.

¹¹⁵ (Congressional Research Service ,2019). China's Economic Rise: History, Trends, Challenges, and Implications for the United States.

¹¹⁶ *ibid*

¹¹⁷ (Woetzel et al,2019).

¹¹⁸ (Ashley Jr, 2019,p.5).

¹¹⁹ (Military and Security Developments Involving the People's Republic of China, 2018).

However, as per Rudd (2019), the Chinese rapid military development and artificial intelligence capabilities have been identified to be a prior concern above the American classical concerns about China's¹²⁰.

In the geopolitical perspective, China has been gradually increasing its agenda. For example, China involvements in the maritime dispute, in South China, indicate its strong commitment in safeguarding its sovereignty, security and geopolitical strategy resulting in a reinforcement of its air and marine capacity.

In fact, concerning the Sino-American relationship, China has been indicated to already express its discontentment on the U.S. military presence influence in Asia as it interferes with China's rise and sovereignty, particularly in a Taiwan conflict scenario, and in the East and South China Seas¹²¹.

China's first international military base in Djibouti¹²² also indicates a strong sign of rising power, and its global influence. Nevertheless, due to the delicate balance of power in the Middle East, and North Africa (MENA), Beijing's decision brings deep concern of possible further instability¹²³.

Notwithstanding, 2015 marks PRC's fundamental shift in foreign and security policy with the development of its first official overseas military facility in Djibouti¹²⁴. Djibouti geographical position offers a strategically position for foreign military bases due to the importance of Bab elMandeb - a critical maritime chokepoint and a main port for landlocked Ethiopia - East Africa's largest and fastest growing economy¹²⁵.

¹²⁰ (Rudd, 2019).

¹²¹ (Ashley Jr, 2019.p.9).

¹²² Republic of Djibouti. A country located in the Horn of Africa

¹²³ (Chaziza,2018,p.6).

¹²⁴ (Downs et al,2017.p.1).

¹²⁵ ibid

For this reason, Djibouti is seen as the leading hosting nation for foreign military settlements – the overseas hub. Djibouti alone hosts 7 foreign military bases: U.S.A, China, France, Japan, Germany, Italy, and Spain¹²⁶.

Nonetheless, as per a Washington-based specialist on Russian and post-Soviet affairs, Daly (2018), highlights the danger of the combination of China's overseas military expansion and Djibouti's congested territory could trigger a collision point¹²⁷.

As per Chaziza (2018), this historical Chinese military base development raises two essential questions towards the motives behind it¹²⁸: The drivers behind China's military-strategic presence in Djibouti, and how this will interfere on one of China's Foreign Policy Five Principles - non-interference¹²⁹. Based on his study, Chaziza (2018), conclusion suggests that the drivers that influence China in establishing a military naval base are based on two components: geo-strategic and geo-economic interests¹³⁰.

Furthermore, Chaziza (2018), also suggests that China since the end of the Cold War has been shifting away from its traditional non-interference policy and Djibouti Chinese naval base is set to be an example not just for economic expansion purposes but as well military¹³¹. Additionally, Djibouti represents also a key maritime route element for China's part of its Belt and Road Initiative (BRI).¹³².

¹²⁶ (Melvin,2019).

¹²⁷ (John Daly, 2018).

¹²⁸ (Chaziza,2018.p.7).

¹²⁹ China's non-interference policy is one of the Five Principles of China's foreign policy stated by the Panchsheel Treaty, signed on April 29, 1954 : Mutual respect for each other's territorial integrity and sovereignty, Mutual non-aggression, Mutual non-interference in each other's internal affairs, Equality and cooperation for mutual benefit and Peaceful co-existence. Retrieved from: Panda, A. (2014). Reflecting on China's Five Principles

¹³⁰ (Chaziza,2018.p.17).

¹³¹ ibid p.11

¹³² (Melvin,2019).

2.3.1 China's Foreign Policy and Role in the UN Peacekeeping after the Cold War

In 2012, Ayenagbo et al, have expressed that since the end of the cold war, China's foreign policy is based on stability and international cooperation¹³³.

Nevertheless, to counterbalance the unipolar world due to the U.S.A hyper power dominance, China's foreign policy indicated focus in particular on improving relations with Russia and Europe¹³⁴.

Furthermore, from the security perspective, China has also expressed its concern, arguing that a post-cold war era requires nations to fully embrace the importance of economic and diplomatic cooperation¹³⁵. Until the end of China's Communist Revolution in 1949 and the development of Chinese and American relations from 1971, Chinese foreign policy has shown signs of deficiency in terms of international engagement and non-participation in multilateral organizations, such as the UN¹³⁶. Notwithstanding, with the necessity to avoid the perception of China as a threat, to improve standing, perception, and international cooperation, China's foreign policy objectives changed in the late 1980s. Ever since, Beijing, has been engaging in non-violent intervention, and recourse to diplomacy¹³⁷. To do so, peacekeeping contributions have steadily become China's soft power strategy, allowing Beijing to advance its interests abroad while fostering collaboration with other nations, as it undergoes its so-called "peaceful rise"¹³⁸. Improving its reputation, China has evolved into a champion of UN peacekeeping in the last decades¹³⁹. At the end of 2018, China became the second-largest peacekeeping

¹³³ (Ayenagbo et al, 2012,p.24).

¹³⁴ *ibid*

¹³⁵ *ibid*

¹³⁶ (Institute for Security & Development Policy, 2018,p.1).

¹³⁷ (Institute for Security & Development Policy, 2018,p.2).

¹³⁸ *ibid*

¹³⁹ (Zürcher, 2019,p.4).

contributor by participating in nine peacekeeping operations, including the “big five” (Mali, Sudan, Congo, Central African Republic, and Darfur).¹⁴⁰. Regardless the truly intentions of China’s with its foreign peacekeeping interventions, China’s peacekeeping capabilities and diplomatic influence shall not be underestimated. On contrary, China is making a statement – its building its international influence.

2.4 China’s Belt and Road Initiative

Announced by President Xi Jinping, in 2013, the Belt and Road Initiative (BRI), also known as China’s 21st century Silk Road or One Belt One Road (OBOR), represents one of China’s greatest long terms plans to promote economic development and cooperation, prosperity, peace and friendship among all countries involved¹⁴¹. Inspired on, the long historical Silk Routes, that existed for thousands of years, connecting Asia, Africa, and Europe, by allowing different cultures to share knowledge, ideas, religions, languages, and goods, the name Silk Road comes from one of China’s most important exports—silk¹⁴². BRI consists in two distinguish opportunities.

Firstly, The Belt is a land corridor that passes through Central Asia before reaching Europe and connects two of the world’s largest economies, China and Europe. Secondly, the Road is a maritime route that connects China and Europe, including Southeast Asia, South Asia, the Middle East, and East Africa, a region that is home to 42% of the world’s population and 25% of its GDP¹⁴³. As per The Department of Defense (2018), the BRI is a Chinese strategic attempt to build

¹⁴⁰ *ibid*

¹⁴¹ (Koboević, Kurtela and Vujičić, 2018,p11).

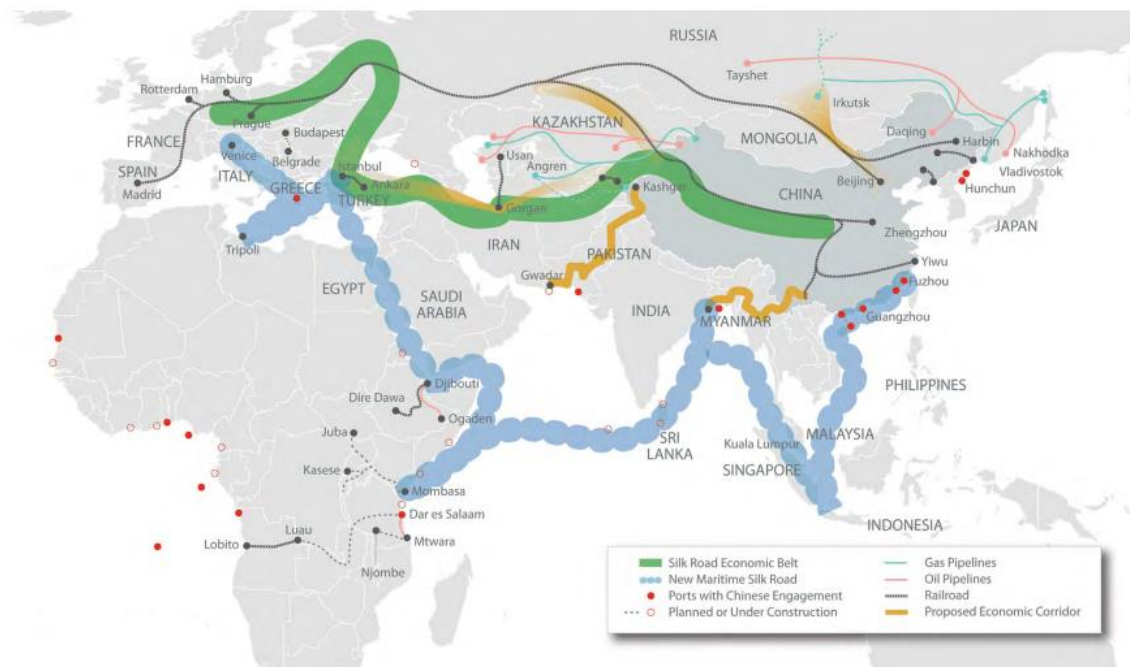
¹⁴² *Ibid*,p113

¹⁴³ (Wong and Jia, 2017).

strong ties across the globe to shape its goals, and to protect against any confrontation or criticism on sensitive issues¹⁴⁴.

However, as per Luft (2017,(p. 47). the BRI project may drag the U.S.A to an arms race, urging China to increase its land, and sea power leading to a challenging friction between these two nations. For this reason, Luft (2017.p. 5), suggests the importance and belief to enhance a secure cooperation with China.

Figure 3: China’s New Silk Road



SOURCE: Luft, G, & Atlantic Council of the United States. Brent Scowcroft Center on International Security. (2017). Silk Road 2.0: US Strategy Toward China’s Belt and Road Initiative. Retrieved from https://www.atlanticcouncil.org/images/US_Strategy_toward_Chinas_BRI_web_1003.pdf

¹⁴⁴ (Military and Security Developments Involving the People’s Republic of China, 2018).

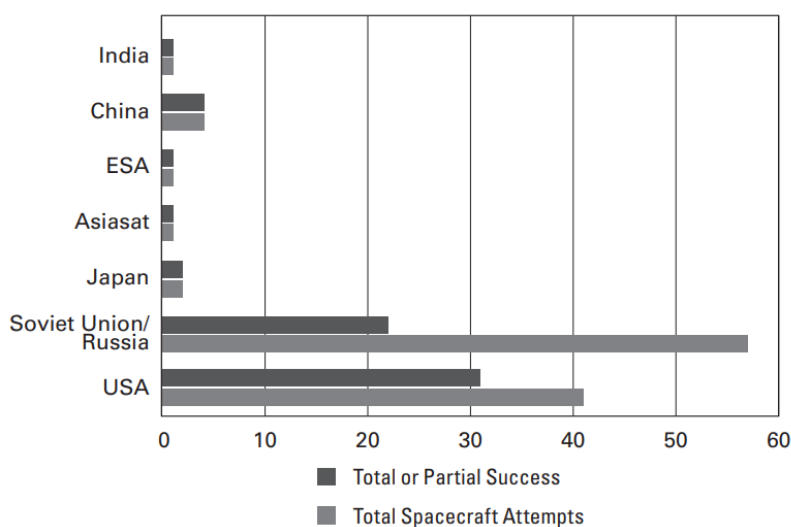
2.5 China’s Space Program

Since the first unmanned successful spacecraft (Luna 2), landing on the surface of the moon the space exploration has been dominated between the U.S.A and the USSR¹⁴⁵.

Notwithstanding, with China’s successful first spacecraft (Yutu)¹⁴⁶ landing on the moon, on 14 December, 2013, the sixty years of space legacy seemed to start to shift towards a Tripolar world.

In 2007, 51 years later, since the Chinese space program was officially set off (on 8th October 1956)¹⁴⁷ the first China’s deep-space vehicle mission was launched, which also became the first object to make contact with the Moon in 2007 - the Chang’e 1¹⁴⁸. Ever since, several missions, part of the Chinese Lunar Exploration Program, have been launched positioning China as the third global space exploration entities surpassing the European Space Agency (ESA).

Table 4: Total Lunar Spacecraft Attempts by Nation/Agency 1958-2016



Source: Siddiqi. (2018). Beyond Earth: A Chronicle of Deep Space Exploration, 1958-2016.

¹⁴⁵ (Siddiqi, 2018,p.13).

¹⁴⁶ (Siddiqi, 2018, p.291).

¹⁴⁷ (Ebeling, 2016,p.7).

¹⁴⁸ (Siddiqi, 2018,p.257).

China's successful space missions and developments seem to indicate a strong commitment to become a global power in space exploration. Although the fact that the U.S.A still holds an advanced reasonable technological and research leadership when compared to China, this should not be a reason to underestimate Beijing's ambitious long term capabilities in becoming a new leader in the space exploration¹⁴⁹.

Considering the National Aeronautics, and Space Administration (NASA), 40 years nearly 40-year progression from first human spaceflight (1961), to the first space station module in 1998, China may be able to achieve this same progression in half of the time with its plan to launch its long term space module in 2020¹⁵⁰. For this reason, policy- makers are warned of the implications that the Chinese space long term ambitions and successful missions may represent, especially in possibly surpassing the U.S.A space preeminence¹⁵¹.

China's ambitions and characteristics of a superpower are not unnoticed. In fact, in terms of economic, military and geopolitical influence, China has not just stated its goals but as well it has proven its capabilities, and achievements. Despite its distinguished authority regime when compared to the west, China's ambitions are clear. The question is what China's boundaries in values and strategies are in order to achieve its goals. Is it reasonable to indicate that China holds all features of a role model that searches for global supremacy as the U.S.A, and USSR were during the Cold War?

¹⁴⁹ (China's Pursuit of Space Power Status and Implications for the United States. U.S.-China Economic and Security Review Commission.Bowe 2019. p.11)

¹⁵⁰ (China's Pursuit of Space Power Status and Implications for the United States. U.S.-China Economic and Security Review Commission.Bowe 2019. p.12)

¹⁵¹ (China's Pursuit of Space Power Status and Implications for the United States. U.S.-China Economic and Security Review Commission.Bowe 2019. p.11)

Chapter III - Cold War: former global dispute for hegemony

Cold War is the last great example of arms race, and hegemony conflict between two powerful countries - U.S.A and the former USSR. However, considering the shifting of balance of power the actors for global dispute in the next 50 years are strongly to be the U.S.A and China.

This chapter and its literature intend to analyze the stages and drivers behind the historical dispute for global influence and hegemony between two superpowers that lead the world to a historical security dilemma episode resulting in an imminent nuclear disaster. I believe this is a good reference point to compare the China-U.S.A hegemony race in order to highlight not just the identical initial patterns that follow between the dispute for global leadership but as well to identify an arms race patterns that are implied to occur throughout the additional stages in the Cold War but as well to help to imply if we are experiencing an initial era of arms race based on the previous battle between two superpowers.

Additionally, this chapter intends to highlight several more dispute correlations such as political and ideological ideas between the Cold War and the 21st century power rivalry between China and the U.S.A (also implied as the New Cold War). The purpose to approach and identify these episodes of dispute between these two Thucydides Trap case types is to explore the effects, causes, and drivers.

3.1 Cold War - The beginning and different stages

When WW2 came to an end, a dramatically power shift occurred as the U.S.A. and the former Soviet Union (USSR), were than to become the two great powers. Nonetheless, after the fall of the Nazi and Japanese imperial regime, the dramatically power shift and balance of power lead the world to a new conflict – The Cold War.

The term Cold War first appeared in George Orwell essay “You and the Atom Bomb,” in 1945, as a result of the possible consequences of the atomic age after the dropping of the “Little Boy” in Hiroshima and “Fat man” in Nagasaki¹⁵². Orwell considered in his work the political and social implications from a state once achieving an unconquerable status quo leading to a “cold” relation with other nations¹⁵³. Another characteristic of the definition of the Cold War has been stated as the spiral mistrust between state adversaries that lead to the enhancement of security concerns unfolding the security dilemma¹⁵⁴.

Despite de indirect conflict between the U.S.A and USSR during the Cold War, these states have been involved in proxy wars such as the Korean War and the Vietnam War where China¹⁵⁵ was also involve in both conflicts.

Additionally, several events such as nuclear arms race and space wars have occurred leading the world to an imminent dangerous nuclear conflict, which later was followed by remarkable treaties on behalf of peace and security that were signed along this period. With the fall of the Soviet Union, the Cold War came to an end.

¹⁵² (Blakemore, 2019).

¹⁵³ (Blakemore, 2019).

¹⁵⁴ (Leffler and Painter, 2005,p.16).

¹⁵⁵ (Becker, 2015,p.1).

In summary, with the end of the Cold War that resulted in the fall of two superpowers, two new ones emerged - the U.S.A and the USSR. Nonetheless, the consequences of the distinct political differences between these two nations aggravated when both encountered a nuclear threat. Whether or not there was any reason to believe that the enemies' nuclear proliferation could jeopardize their hegemony and sovereignty the question was how much were these states able to defend and deal under an imminent nuclear paranoia threat.

The beginning of the Cold War started when the so-called Three Greats (USA, UK, and USSR), agreed for the first time in 1945 on the post-war division of Europe¹⁵⁶. Ever since, the Cold War as became a period of history that has been vastly studied among researchers, focusing on the development of different stages that occurred, in order to better understand the unpredictable behavior between two states with different political ideologies when disputing for global dominance.

This period was also termed as the 'iron curtain' to describe the two distinct political principles that were dividing Europe: capitalism and democratic ruling the Western Europe and Communism in the Eastern part. As a result of the different ideological and geopolitical approach between these two nations several events occurred: Nuclear Stage, Arms Race, Space War, Trade War and Proxy Wars.

3.2 Cold War - Nuclear Arms Race

After the bombing of Hiroshima and Nagasaki¹⁵⁷ by American atomic weapons in August 1945, an arms race between the United States and the Soviet

¹⁵⁶ (Eloranta and Ojala, 2005,p.12).

¹⁵⁷ (Leffler and Painter, 2005,p.68).

Union began which lasted until the signing of the Conventional Forces in Europe Treaty¹⁵⁸.

Despite the fact that only the United States possessed atomic weapons, proving a global preeminence, all this changed in 1949, when the Soviet Union ignited its first atomic bomb - the RDS-1¹⁵⁹. In result, both nations engaged a race of the development of more and bigger nuclear bombs. In 1952, the United States tested a new and more powerful weapon, the hydrogen bomb, the Soviet Union followed with its own version in 1953¹⁶⁰. This marks the beginning of the nuclear arms race¹⁶¹. This shows clear evidence that the fear of a nation, creates the security dilemma phenomena, leading the world to an arms proliferation, and in result an imminent nuclear threat.

As per Chomsky and Polk (2013), nuclear war since 1945 has reached many times the possibility to erupt has automated systems on both sides of U.S.A and the former USSR warned a nuclear attack which set off an automatic response, however, instant human intervention happened to take action¹⁶².

This takes us back to the question, of how much the new technologies have influenced classical forms of military conflict, in which, the nature of nuclear weapons generated a technological revolution in warfare¹⁶³. Notwithstanding, once tactical nuclear weapons became the "decisive force" due through rapid technological advancements qualitative arms race became more important than quantitative¹⁶⁴.

¹⁵⁸ Signed, in 1990, to reduce possible surprised armed attacks, and major offensive operations in Europe.

Retrieved from: <https://www.osce.org/library/14087> <https://www.nti.org/learn/treaties-and-regimes/treaty-conventional-armed-forces-europe-cfe/>

¹⁵⁹ (Ivanov, 2017).

¹⁶⁰ (Nuclear Arms Race, American Museum of Natural History, n.d)

¹⁶¹ (Atomic Heritage Foundation, 2014).

¹⁶² (Chomsky, and Polk, 2013).

¹⁶³ (Friedman, 2011).

¹⁶⁴ (Lash, 2012,p.36).

3.3 U.S.A–USSR military expenditure - The definition of an arms race

Arms race is a classical phenomenon in International Relations. The concept of arms race can be defined in many different definitions.

As per Harari (2011), “arms racing”¹⁶⁵ is disclosed as a pattern of behavior between states that spreads like a virus that it is driven by the classical IR realism theoretical perspective – survival and reproduction. Another definition of the term is that the arms race is a pattern of competitive acquisition of military capability between two or more countries¹⁶⁶.

A further approach towards the variable meaning of the term arms race is that also complies with the previous definition which is an event that involves increases in real military expenditure by two or more countries in an attempt to keep military superiority, to maintain a balance of power or to maintain a military force¹⁶⁷.

Additionally, Harris (n.d), also indicates that an increase of the proportion of GDP or CGE can be interpreted as criteria for arms race¹⁶⁸. This suggests that an arms race represents the dispute between states that share a similar military capacity and expenditure and an increasing proportion of GDP.

Although the reasonable evidence about nuclear proliferation during the nuclear arms race in the Cold War it is important to support the idea of the arms race by considering as well the military expenditure in this matter. As per figure below, the military expenditure between the U.S.A. and USSR during 1949 and 1991 provided by SIPRI data base.

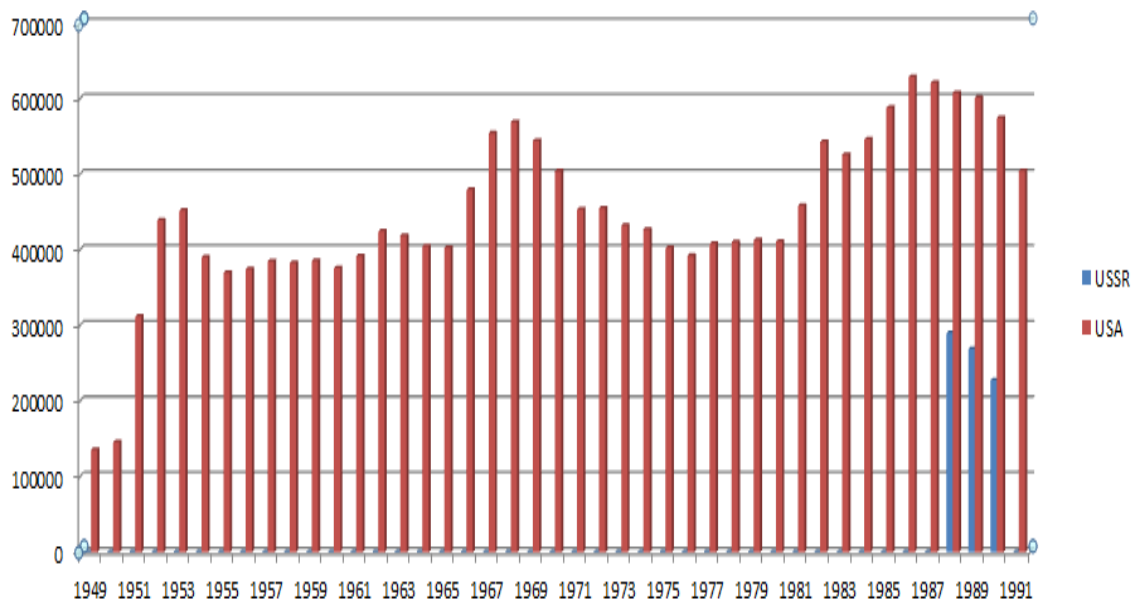
¹⁶⁵ (Harari, 2015,p.271).

¹⁶⁶ (Freeman, 2019).

¹⁶⁷ (Harris, n.d.).

¹⁶⁸ *ibid*

Figure 4: Military expenditure between the U.S.A. and USSR – 1949-1991

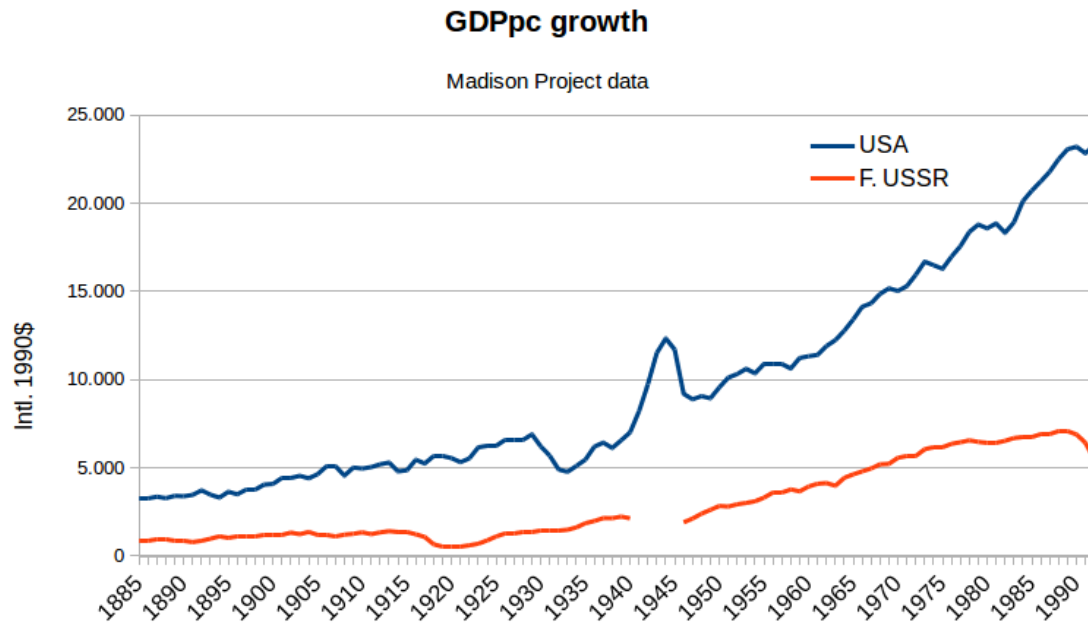


NOTE: Figures are in US \$m.

Source: Excel file: Data for U.S.A and USSR 1949–2018 (excel spreadsheet).
<https://www.sipri.org/databases/milex>

Although the lack of results concerning the USSR military expenditure to explore an accurate projection, there is supportive data that indicates general ascending results. Furthermore, the data also provides an indication of three periods of increased military expenditure due to the proxy wars: Korean War (1950-1953). Vietnam War (1955-1975), and Soviet-Afghan War (1979-1989). Nonetheless, considering the military development, and expenditure, as per Harris (n.d), the country GDP should be also interpreted as criteria to support the phenomenon - arms race.

Considering Harris (n.d) analysis and figure below, both the U.S.A and USSR can be indicated to hold all patterns to suggest an arms race phenomenon.

Figure 5: The U.S.A and USSR GDP Growth

Source: <https://nintil.com/2016/03/26/the-soviet-union-gdp-growth/>

3.4 Space war between U.S.A and USSR

The Cold War also marked the historical Space War between the superpowers. It all began, when the USSR, on October, 4th, 1957, launched by surprise the Sputnik, the world's first artificial satellite and the first man-made object to be placed into the Earth's orbit¹⁶⁹. This action caught by surprise the U.S.A. however, not in a pleasing way. The reason why is due to the overwhelming power of the R-7 missile—seemingly capable of delivering a nuclear warhead into U.S. air space—made.¹⁷⁰ In result, an era of mistrust and fear of dominant space programs began when the U.S.A followed to compete against its biggest rival—the USSR.

¹⁶⁹ (History, 2010). Retrieved from: <https://www.history.com/topics/cold-war/space-race>

¹⁷⁰ (History, 2010). Retrieved from: <https://www.history.com/topics/cold-war/space-race>

Thus, the developments in space programs increased and in 1961 the USSR again surprises the world by sending the first manned space vehicle into orbit. Following USSR remarkable successful space exploration missions the U.S.A responded by landing the first humans on the Moon in 1969 with Apollo 11¹⁷¹.

Since the first Apollo mission (Apollo 1), in 1967, the U.S.A has successfully sent the first humans to leave Earth orbit (Apollo 8), and total of six human landing missions on the Moon. In result, the Apollo program marked the U.S.A supremacy and definition of a superpower in space exploration against the USSR¹⁷². As per (Jha 2017), the Space Race between the U. S.A and the USSR did not just impact the area of space research, but as well in the field of technology. The reason for the importance of this technology was due to its capabilities to protect national defense and security¹⁷³. The problem was the imminent danger of a possible outer space battleground between the superpowers¹⁷⁴. To avoid such an event a basic legal framework of international space law was signed - Outer Space Treaty.¹⁷⁵

In summary, the space race that occurred during the Cold War demonstrates how states are eager and prepared to do what is necessary to achieve their dominance even if the rivalry arena is in outer space.

Therefore, the Cold War has been selected to be examined in this study as it offers a good guidance of the drivers, dangers, and challenges behind the distinct developments of events when great powers are struggling for survival.

¹⁷¹ (History, 2010). Retrieved from: <https://www.history.com/topics/cold-war/space-race>

¹⁷² (Sagdeev and Eisenhower, 2008).

¹⁷³ (Jha, 2017).

¹⁷⁴ *ibid*

¹⁷⁵ *ibid*

4. Chapter IV - China- U.S.A Technological War: dispute for dominance

For this chapter, the following references have been selected as they stress the economic and military rivalry between China, and the U.S.A over global leadership on AI, and AWS. This chapter also pretends to highlight the historical relations between these two nations to search for identical global dispute patterns such as arms race, space exploration, with the Cold War (chapter 3). Furthermore, this chapter focuses mainly on the US-Sino developing relations, challenges, and dangers of their rivalry when disputing for technological supremacy.

From what is visible at the policy level, there is not (yet). a declared arms race on autonomy considering up to the March 2017 official defense strategy publications of the 10 largest arms-producing countries—namely the USA, the UK, France, Russia, Italy, Japan, Israel, Germany, South Korea and India—and China¹⁷⁶. However, China and the U.S.A, have expressed interest in the developments of automated military systems in official publications to varying degrees¹⁷⁷.

Considering these statements, there is good reason to believe that these two nations already initiated they proliferation program involving autonomous systems. Following the global influence of these two sovereign countries together with the proliferation patterns that seem to be equal during the dispute between U.S.A and the former USSR, as indicated, this chapter intends to investigate and present the current developments of the Sino-US relations, and whether they represent a danger towards peace.

¹⁷⁶ (Boulanin and Verbruggen, 2017,p.19).

¹⁷⁷ *ibid*

4.1 Thucydides Trap – China and U.S.A

Around 2500 years ago, Thucydides, one of the greatest historians of the Ancient Greek wrote about the historical accounts of the Peloponnesian War (431-404 BCE). – the rivalry dispute between a sea power, Athens and a land power, Lacedaemon (Sparta).¹⁷⁸. What is interesting about Thucydides work is how he highlights the events that shaped the study of geopolitics with the famous quote:

*“What made war inevitable was the growth of Athenian power
and the fear which this caused in Sparta¹⁷⁹”*

With this said, this brings us to the analysis made by Allison (2015), that stresses the Thucydides quote that highlights the dangerous dynamic that occurs when a rising power threatens to displace a ruling power¹⁸⁰. Nonetheless, we must not just analyze conflicts on the basis of events at the surface level, but also to considerer the historical, and strategic level. In the historical rivalry perspective, between two superpowers, in the past five centuries, starting from the bipolarity dispute of Portugal, and Spain in the late 15th century until the end of the Cold War (late 20 th century). 15 Thucydides Trap case studies have been identified which 12 ended in war (see figure below).

¹⁷⁸ (Nash, 2018).

¹⁷⁹ This original quotation has been retrieved not from the original source – *The History of the Peloponnesian War* but instead from Frankel (1996,p.142).

¹⁸⁰ (Allison, 2015).

Table 5 : Thucydides’s Trap 15 Case Files

1	Late 15 th century	 Portugal	 Spain	Global empire and trade	No war
2	First half of 16 th century	 France	 Hapsburgs	Land power in western Europe	War
3	16 th and 17 th centuries	 Hapsburgs	 Ottoman Empire	Land power in central and eastern Europe, sea power in the Mediterranean	War
4	First half of 17 th century	 Hapsburgs	 Sweden	Land and sea power in northern Europe	War
5	Mid-to-late 17 th century	 Dutch Republic	 England	Global empire, sea power, and trade	War
6	Late 17 th to mid-18 th centuries	 France	 Great Britain	Global empire and European land power	War
7	Late 18 th and early 19 th centuries	 United Kingdom	 France	Land and sea power in Europe	War
8	Mid-19 th century	 France and United Kingdom	 Russia	Global empire, influence in Central Asia and eastern Mediterranean	War
9	Mid-19 th century	 France	 Germany	Land power in Europe	War
10	Late 19 th and early 20 th centuries	 China and Russia	 Japan	Land and sea power in East Asia	War
11	Early-20 th century	 United Kingdom	 United States	Global economic dominance and naval supremacy in the Western Hemisphere	No war
12	Early-20 th century	 United Kingdom supported by France, Russia	 Germany	Land power in Europe and global sea power	War
13	Mid-20 th century	 Soviet Union, France, UK	 Germany	Land and sea power in Europe	War
14	Mid-20 th century	 United States	 Japan	Sea power and influence in the Asia-Pacific region	War
15	1940s–1980s	 United States	 Soviet Union	Global power	No war

Source: Thucydides’ Trap, Can America and China Escape the Thucydides Trap? Harvard Kennedy School, Case file, 2019

Considering the case study in this work (China-U.S.A), this brings us to the challenge of China’s rise and its impacts towards the principal ‘architect, and guardian’ nation of the past 100 years in the international order – the U.S.A¹⁸¹.

The problem is that this ‘‘American century’’ as many historians may call it, has accustomed the U.S.A in being a ruling power and the idea of a country such as

¹⁸¹ (Allison, 2018).

China in becoming as powerful or even displacing the U.S.A withdraws the attention to the danger of a similar past rivalry Thucydides Trap case types¹⁸².

In other words, Alisson's project brings a core question if Thucydides Trap about the inevitably of war, between rising powers, and established great powers, apply to the future of China and the U.S.A¹⁸³. Due to the dynamic reasons that drives nations into a dispute that can lead to confrontation the challenge is whether both nations can escape the "Thucydides Trap"¹⁸⁴.

As China is becoming a global power, and estimated to become the strongest global economy, the idea of the new rivalry between two global powers (U.S.A-China), seems to be plausible, hence, bringing the attention of the classical 'Thucydides' Trap. As a result of several speeches over the course of 2018, this challenge has been clarified in the following way¹⁸⁵:

- One of Beijing's layers of core interest is the survival of the regime
- The new sphere of U.S.A -China battlefront of competition to drive or destroy the economies of the 21st century – the tech war
- China – U.S.A foreign policy transition from "strategic engagement" to "strategic competition"
- U.S.A.-China decline relations in 2019, resulting in the increasing distrust on both sides

With this said, and following the recent contentious relations between the U.S.A and PRC, patterns of global hegemony dispute are occurring. The question is whether these nations can survive the Thucydides Trap. Furthermore, to learn more about the current relations between these two super powers the next section has been selected in order to provide the reader a better knowledge about the

¹⁸² ibid

¹⁸³ (Rudd, 2015).

¹⁸⁴ (Rudd, 2019,p.5).

¹⁸⁵ ibid

different phases of the Sino-U.S relationship, China's strategic geopolitical agenda and the trade war.

4.2 China- U.S.A relations

2018 marks the strategic turning point of the long 40-year history of the U.S.-Sino relations¹⁸⁶. The rivalry between the emerging China and the established U.S.A is being stated has the defining issue of international relations in the 21st century¹⁸⁷. After, Vice President of the U.S.A Mike Pence's major speech in 2018 about the challenges that China imposes to the U.S.A a new era of global order and diplomacy as began¹⁸⁸. However, to address the China challenge, Donald Trump administration as announced its determination to take actions towards as it sees to a Cold War that China has been engaging towards a U.S.A that has not taken any reaction¹⁸⁹. Trump's national security strategy identifies China as 1 of 3 main sets of challenges to U.S. national security¹⁹⁰. As per Rudd (2019), Washington no longer views China pleased with its strategic status quo. Instead, it observes a China that is determined to defend its strategic geopolitical agenda whether¹⁹¹:

- via sea by islands reclamations in the South China Sea
- via land through the Belt and Road Initiative or also known as the Silk Road
- via cyber strategies

¹⁸⁶ (Rudd, 2019,p.5).

¹⁸⁷ *ibid*

¹⁸⁸ Vice President Mike Pence's China Speech at Hudson Institute,2018,
<https://www.youtube.com/watch?v=mYAHPPXmcts>

¹⁸⁹ (Rudd, 2019,p.7).

¹⁹⁰ (Tran, 2018).

¹⁹¹ (Rudd, 2019,p.7).

As a result of China's strategic agenda, U.S. National Security Strategy in December 2017 formally conclude the transition of the U.S.A-China strategic engagement to a strategic competition¹⁹². With this said, this implies that a historical recognition of a ruling superpower that a new superpower has emerged and become a competitive threat.- also known as the dangerous third phase in the post-1949 history of the U.S.-Sino relationship.

As per Rudd (2019), the U.S.-Sino relationship can be characterized in 3 phases¹⁹³:

- Phase I -strategic hostility (1949 -1972).
- Phase II -strategic engagement. (1972-2017).
- Phase III- strategic competition (2017-2019).

Furthermore, concerning the instability between major powers, Global Risk Report (2019) reports the China -U.S.A relationship as an emerging geopolitical global risk where the differences of power and values may represent the main pillars in weakening security alliances¹⁹⁴. Plausible evidence throughout careful and long term studies concerning the Sino-U.S relations seem to support the embittering relations and the danger that this may represent to global peace and security. In fact, if we are to determine if the U.S.A and China could be involved in a war, on July 18, 2018¹⁹⁵, a trade war between these two nations ignited. As a result to determine if the U.S.A economy has been affected due to unfair trade practices by the government of China, President Donald Trump in August 2017 instructed the U.S.A Trade Representative for an investigation¹⁹⁶. Notwithstanding, in response, China also applied imposed retaliatory tariffs on U.S.A imported goods

¹⁹² *ibid*

¹⁹³ *ibid*

¹⁹⁴ (World Economic Forum, 2019,p12-13).

¹⁹⁵ (Goel,2018).

¹⁹⁶ (Havránková, 2019).

which lead to a trade war between these two nations¹⁹⁷. A trade war is the trade dispute between countries by engaging economic attacks via tariffs and quotas.

This economic battle is also referred to be a side effect from protectionism¹⁹⁸. Since the beginning of the trade war, the Sino-American relations seemed to have embittered expanding beyond trade to foreign exchange and politics¹⁹⁹.

However, will this economical friction bring any beneficial results to both nations? It seems during the course of the last six months since the trade war as started; both nations are experiencing loss of billions of dollars. ²⁰⁰. While in the U.S.A the biggest impact is seen on firms that rely on the import of Chinese parts and components, in China, the economic impact is seen in manufacturers of machinery, chemicals, computers, and communications equipment²⁰¹. Additionally, China and the U.S.A are not the only states who are suffering with this economic collision. As rest of the world is highly dependent in the import of goods from both nations, the economic effects of this trade war is also impacting the economic stability of several hundreds of countries²⁰². This scenario clearly indicates the negative impacts towards the global economy and threat for future growth as a result of the embitter US-SINO relations²⁰³.

While these two nations represent major pillars in the maintenance for global and economic security, the same they have the power to disintegrate it. This section has provided some information about the gradual developments and instability between the Sino-U.S relationship in the economic and diplomatic perspective. However, another important subject, that may not be ignored, is the

¹⁹⁷ *ibid*

¹⁹⁸ *ibid*

¹⁹⁹ (US-China Trade War, State of Southeast Asia: 2019 Survey, 2019,)

²⁰⁰ (US-China trade war is a 'lose-lose' situation for them and the world, warn UN economists, UN News, 2019).

²⁰¹ *ibid*

²⁰² *ibid*

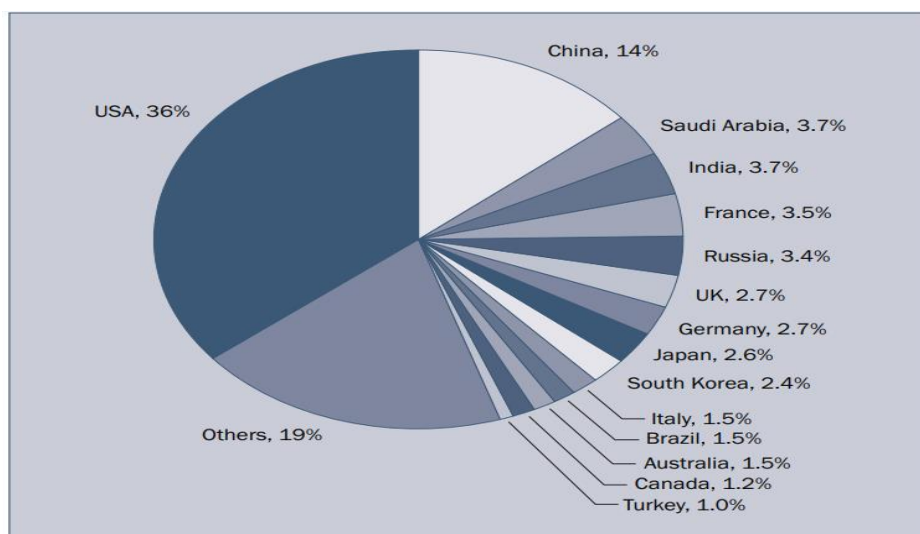
²⁰³ *ibid*

military expenditure. For this reason, the following section intends to approach the most updated data on China's and the U.S.A military expenditure. The importance of this topic is that it will allow the reader to pay attention to the gradual military expenditure of these two nations, their global position in this event, and how much we can relate this event with the same that occurred during the Cold War and the danger that this represents to the maintenance of peace.

4.2.1 U.S.A and China Military Expenditure

In terms of military expenditure, China and the U.S.A hold the global leading position (Fleurant et al 2019). According to Fleurant et al (2019), China has been increasing its military spending for the 24th consecutive year. Almost 10 times higher than in 1994, China's 2018 military investment represents 14 % of global spending. Despite 36 % of the U.S.A military investment in 2018, together with China 14 %, these two nations together represent 50 % of military expenditure worldwide. (See figure below).

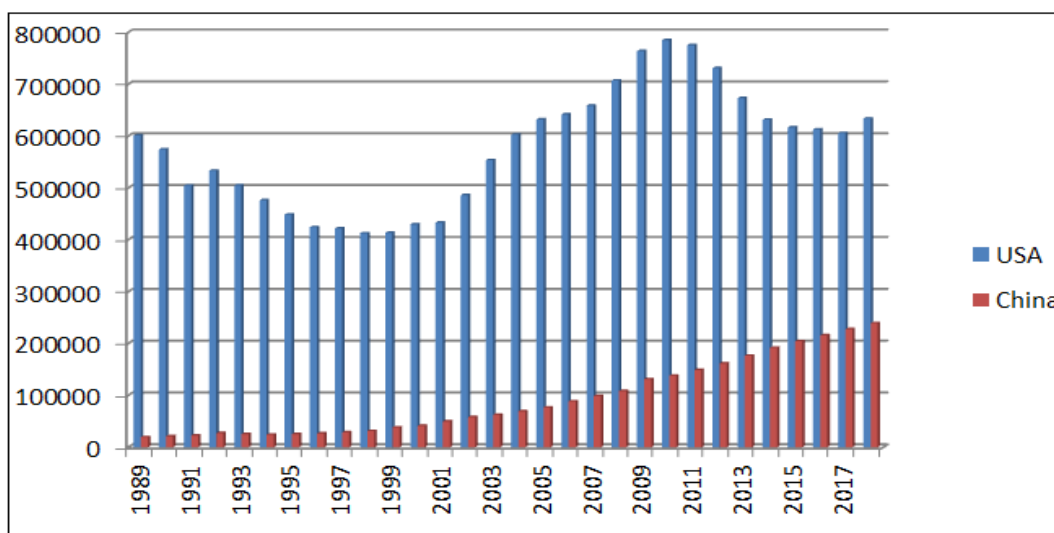
Figure 6: The share of world military expenditure with the highest spending in 2018



Source: SIPRI Military Expenditure Database, Apr. 2019.

Although the non-official data regarding China’s military expenditure, on a historical long term perspective between 1989 and 2018 the chart below indicates a decrease level between 2011 and 2017 from the U.S.A and ascending levels from China. However, for the first time after 7 years, the U.S.A military expenditure has increased.

Figure 7: China – U.S.A military expenditure



NOTE: Figures are in US \$m.

Retrieved by Excel file: Data for U.S.A and USSR 1949–2018 (excel spreadsheet). <https://www.sipri.org/databases/milex>

Considering the data with regards to the military expenditure between China – U.S.A there is evidence to believe that these two nations are both investing at a high rate. The question is, with the data presented, together with the current and gradual economic Sino-U.S relations are these plausible signs of a security dilemma that is already occurring? While the last security dilemma event occurred during the Cold War, and the main technology involved was nuclear, in this period of time in history of IR, Artificial Intelligence seems to be the current state of the art technology. For this reason, the following section will approach the mutual interest and investments by both nations of this case study in this technology - Artificial Intelligence.

4.4 U.S.A -China AI race

By far the U.S.A and China are the major countries that are conducting a long term vision and investment in AI. As per Goldfarb and Trefler (2017), AI developments have the potential to radically shift the global balance of power²⁰⁴. However, the global balance of power may not be the only potential radical shift that may follow. Chinese guided sophisticated missile systems may disrupt, for instance, the concept of modern warfare too, transforming the massive defense industry²⁰⁵. In this matter, China and the U.S.A are clearly the biggest investors in AI. In fact, the following tables and figures indicate the ambitious goals and plans of both nations (particular China) in this technology. As per table 6, the data presented indicates a clear 13 % increase of Chinese participants in regards to Major AI conferences within 5 years. Despite the U.S.A leading participation of 34 % the numbers indicate a decrease of 6 %.

Table 6 : Participants at a Major AI Conference

Country	2017	2012	Change
US	34%	41%	-6%
China	23%	10%	13%
UK	5%	5%	0%
Singapore	4%	2%	2%
Japan	4%	3%	1%
Australia	3%	6%	-2%
Canada	3%	5%	-3%
India	2%	1%	1%
Hong Kong	2%	3%	-1%
Germany	2%	4%	-1%
France	2%	4%	-2%
Israel	2%	4%	-3%
Italy	2%	2%	-1%
Other	10%	10%	0%

Source: http://www-2.rotman.utoronto.ca/~dtrefler/papers/Goldfarb_Trefler_AI_2017.pdf

Additionally, as per table below among 10 American companies 2 are Chinese.

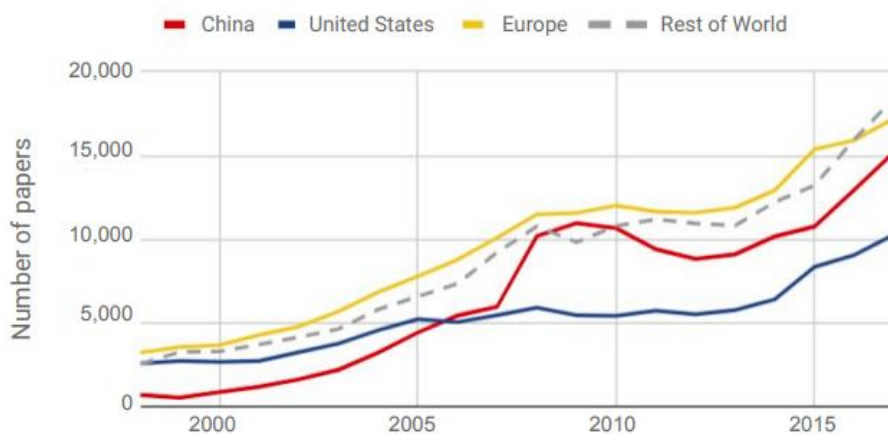
²⁰⁴ (Goldfarb and Trefler, 2017,p.2).

²⁰⁵ ibid

Furthermore, AI is an increasing topic within the academic research too, and therefore this deserves a careful attention about the possible interests and implications of this technology.

After Europe (28%), China (25 %) is the second leading publisher of AI papers on Scopus. The U.S.A comes in third with 17 % (table 8).²⁰⁶ China has increased 150 % the numbers of published papers on the *Fourth Industrial Revolution* between 2007 and 2017²⁰⁷.

Figure 8: Annually published AI papers on Scopus by region (1998-2017).



Source: The AI Index 2018 Annual Report.

Furthermore, what is interesting about the different areas of research in the field of AI is China's 400 % government AI papers increase. This indicates clear evidence of China's ambition for global superiority in this technology (figure 9). In fact, 7 of the world's 10 biggest AI startup companies are from China and the U.S.A²⁰⁸. While China leads the chart with 5 companies (two of them at the first top position) the U.S.A follows with 3²⁰⁹. The type of applications being invested and researched in these companies vary. While the Chinese startups focal point are

²⁰⁶ (Shoham et al, 2018).

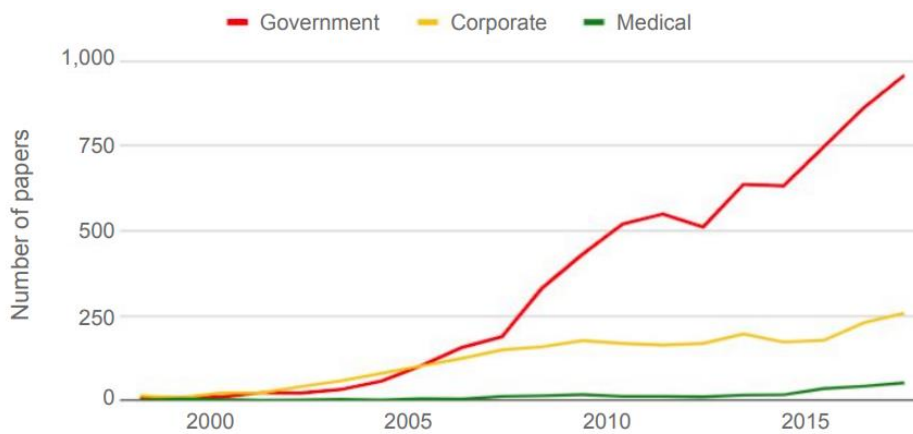
²⁰⁷ ibid

²⁰⁸ (Nanalyze, The 10 Biggest Artificial Intelligence Startups in The World, 2018)

²⁰⁹ ibid

mainly in media, computer vision, and robotics applications, the U.S.A startups focus mainly in autonomous vehicles and fintech applications²¹⁰.

Figure 9: Papers by sector affiliation



Source: The AI Index 2018 Annual Report.

The provided data offers evidence that the main actors investing and disputing for leadership in AI are in fact, China and the U.S.A. Despite the mutual leadership and ambitions towards AI, how will these countries prepare and defend their technological superiority? In response to the former USSR technological surprises during the cold war and in order to protect their national security, the U.S.A as launch a Defense Advanced Research Projects Agency (DARPA).

In response to the launch of the Sputnik satellite by the former USSR, the Defense Advanced Research Projects Agency (DARPA) was established to avoid further *'strategic technological surprises'*²¹¹.

Ever since DARPA is the agency responsible for the development of technologies with the purpose to maintain the U.S.A military superiority and to defend its national security²¹². Technological military advances such as self-guided

²¹⁰ *ibid*

²¹¹ (Defense Advanced Research Projects Agency).Retrieved from: <https://www.darpa.mil/about-us/about-darpa>

²¹² (Defense Advanced Research Projects Agency: Overview and Issues for Congress, July 2018).

missiles, stealth, and unmanned vehicles have been one of DARPA's state-of-the-art developments over the last decades²¹³. Notwithstanding, in 2017, artificial intelligence and autonomous systems, have been presented as the new relevant technologies for DARPA's future programs²¹⁴.

Following 2017's emphasis on AI and AWS, in 2018, the United States Department of Defense (USDOD), releases its first AI military strategy plan – the Artificial Intelligence Strategy²¹⁵. The Artificial Intelligence Strategy is the result of the USDOD awareness on AI threat towards its prosperity and security²¹⁶. Furthermore, besides enhancing the importance to strengthen its military efficiency and effectiveness capacity, a sign of fear for the destabilization in the international order has been stressed due to Russia and China's significant investments in AI for military purpose²¹⁷.

4.5 AI race and AW developments

This section highlights one of the main topics of this study – arms race in AI. As per Slijper et al (2019), there is the existence of a beginning of an AI arms race²¹⁸. As per Johnson 2019, AI may bring fundamental changes to military influence, with the implication of reordering the balance of power²¹⁹.

Due to China's and U.S.A leading superiority in AI, remain nations are threaten to become economically dependent, creating geopolitics of AI.²²⁰ Stone et al (2016) stated the importance of careful monitoring and deliberation about the

²¹³ A Selected History of DARPA Innovation <https://www.darpa.mil/Timeline/index.html>

²¹⁴ (Defense Advanced Research Projects Agency: Overview and Issues for Congress, July 2018).

²¹⁵ (Department of Defense Artificial Intelligence Strategy, 2018).

²¹⁶ *ibid*

²¹⁷ *ibid*

²¹⁸ (Slijper, Beck and Kayser, 2019, p.34).

²¹⁹ (Johnson, 2019).

²²⁰ (Cummings et al, Artificial Intelligence, Chatham House Report, The Royal Institute of International Affairs, 2018).

implications of AI advances for defense and warfare, including potentially destabilizing developments and deployments²²¹.

With this, an AI race can be described considering the AI index that measures the development of AI within the military technologies and China's ambition for economic and military preeminence in AI²²². Nonetheless, grave concerns in the development of fully autonomous weapons have been stated²²³.

As per Klare (2019), the danger of the investment in such emerging autonomous technology is the unfamiliar consequences behind it²²⁴. Another hazard is a race for autonomy and its impacts and dangers are unknown²²⁵.

Additionally, concerning the danger of the outcome of the development of AW, Slijper et al (2019), have implied an initial stage of AI arms race and warned potential catastrophic results for humanity if states do not engage human control over the emerging technological weaponry²²⁶. For this reason, Slijper et al (2019), suggest an international agreement between states upon rules banning autonomous weapons and also for the private sector to agree in not to apply the development on these weapons as it may lead to an AI arms race without any winners²²⁷.

Following the PAX 2019 (warning on the development of these weapons) and the PAX 2013 Campaign to Stop Killer Robots, questions regarding legal, ethical and security concerns are at the hedge of this technology.

Considering the calls and suggestions of the dangers of AW, and the beginning of an AI arms race, the U.S.A and China seemed to have already achieved

²²¹ (Artificial Intelligence and Life in 2030, One Hundred Year Study on Artificial Intelligence, September, 2016, p3)

²²² (Shoham et al, 2018, p.65).

²²³ *ibid*

²²⁴ (Klare, 2019). *Autonomous Weapons Systems and the Laws of War*

²²⁵ *ibid*

²²⁶ (Slijper, Beck and Kayser, 2019, p34).

²²⁷ *ibid*

remarkable developments in this technology to be used in different scenarios with the purpose to protect their sovereign. The questions are whether or not these developments can be already considered signs of a security dilemma in which these two sovereigns are already engaged. In order to understand and learn more about the drivers for China's developments in AI, the following section is being selected.

4.6 Drivers for China's developments in AI from US perspective

China is the U.S.A most ambitious competitor in the international AI market²²⁸. In result, China as a potential international rival in the AI market the U.S.A is being forced to compete for innovative military AI applications²²⁹.

One of the main reasons for the importance for the U.S.A to seek for competence in this field is due to China's releasing a plan in 2017 that states its ambition to capture the global lead in AI development by 2030²³⁰. Currently, China is primarily focused on using AI to make faster and more well-informed decisions, as well as on developing a variety of autonomous military vehicles and systems²³¹.

Artificial Intelligence has been identified as one of China's leading-edge technologies for rapid developments and autonomous and swarm systems are one of the priorities²³². With around 800 million potential customers of AI-powered products, China holds a significant leading position in one of the world's largest Internet markets and the robotic industry²³³.

²²⁸ (Congressional Research Service, 2019,p.19).

²²⁹ *ibid*

²³⁰ *ibid*

²³¹ *ibid*

²³² (Military and Security Developments Involving the People's Republic of China, 2018,p.87).

²³³ (He, 2017,p.8).

However, behind every technological advance (especially in the military field), this calls into question major concerns, in particular, a technological competitive rivalry. In fact, as per Fisher (2018), regardless U.S.A currently leadership in AI, China's ambitions is likely to set off a new technology race.

As per He (2019), China's achievements in AI technologies and its involvement in American start-ups may help to increase Chinese capability in military technologies²³⁴.

In fact, with this regards, China's leadership – including President Xi Jinping, believes that being at the forefront in AI technology is critical to the future of global military and economic power competition and believes that China should pursue global leadership in AI technology and reduce its vulnerable dependence on imports of international technology²³⁵.

It is predicted that by 2025 a senior executive at China's third largest defense company predicted that lethal autonomous weapons will exist commonly and the increase of AI military is indicated to be inevitable the direction and future"²³⁶.

Nevertheless, concerns regarding that AI may lead to an arms race has been also stressed by China. Chinese officials have expressed concerns relating to a possible arms race associated with AI, as well as the potential need for arms control²³⁷.

Although China's ambiguous positioning on lethal autonomous weapons at UN meetings, it has demonstrated a desire to ban the use of such weapons but not the underlying development²³⁸. Nevertheless, with regards to AI implications in the international security, China has expressed concern about possible arms race

²³⁴ (He, 2017,p.9).

²³⁵ (Allen, 2019,p.3).

²³⁶ *ibid.* p.5

²³⁷ (Slijper, Beck and Kayser, 2019,p13).

²³⁸ (Slijper, Beck and Kayser, 2019,p13).

associated with AI, and therefore enhancing the need for international cooperation on new norms and potentially arms control²³⁹. Following China's advances and ambitions some predictions have been implied as follows²⁴⁰:

- AI-ready data will be a key source of advantage: Huge data sets, and more flexibility to use them in AI applications, will become China's core AI advantage
- China will become a world leader in three out of four core AI applications: China's capabilities in Internet AI, Perception AI, and Autonomous AI will not only be very strong but world-leading or co-leading
- China will become a global AI power: Beijing will rise to become an AI innovation center at the level of Silicon Valley, overtaking the likes of Toronto, Montreal, and London

Furthermore, as per Lee et al (2017), AI development is proceeding in four waves. These are happening simultaneously, but with different starting points and velocity, in particular, one wave we shall analyze - Autonomous AI²⁴¹.

1. Internet AI – Internet websites and apps are the biggest sources of user-labeled data today.

2. Business AI – Businesses that have large repositories of data can apply AI to historical or new data to Connect to business processes and aid in decision-making.

3. Perception AI – Perception AI involves digitizing the physical world through sensors and smart devices, collecting new data that may have been previously unavailable, and using it to create new applications.

4. Autonomous AI – The previous three waves of AI are largely software driven, but Autonomous AI uses movement and tactile output to make AI into self-driving cars, robots, and connected things.

²³⁹ Ibid.p.4

²⁴⁰ (Lee, 2017,p.2).

²⁴¹ (Lee, 2017,p.3-4).

The developments that have been made in AI and where they are already being deployed and tested are a proven sign that this technology rapidly will change the world that we know until this day. For instance, AI will contribute for the improvement of efficiency, machine learning, eradicating human error, smart technology with the introduction of automated processes, and much more²⁴². However, in all technologies there are also some problems and concerns. The following section will approach this topic.

4.7 China and U.S.A perspective on AI developments – problems and concerns

A major cause of concern between the U.S.A and China dispute is based on the different ideological political and military principles that separate the Sino-American relations²⁴³. As per Johnson (2019), parallel trends in the shifting geopolitical landscape and disruptive technologies are fundamentally reshaping the security environment, which in turn, will have significant implications for how a future U.S.A.-China crisis or conflict might unfold²⁴⁴. The rapid proliferation, diffusion, and synthesis of AI, together with the opacity and dual-use features associated with this nascent technology, could generate a destabilizing and potentially intractable AI arms race²⁴⁵. Concerns extend to China's private sector which Jack Ma, the chairman of Alibaba has stated that global competition over AI could lead to war²⁴⁶. Despite concerns on AI arms races or even warfare, several China's leadership foresees the development of military usage of AI as

²⁴²(Patrizio, A, 2016)

²⁴³ (Johnson, 2019)

²⁴⁴ ibid

²⁴⁵ (Johnson, 2019).

²⁴⁶ (Allen, 2019,p.5).

inevitable²⁴⁷. Reports suggest that China has already begun to incorporate AI into its next-generation conventional missiles and missile-defense intelligence gathering systems, to enhance their precision and lethality.²⁴⁸

In response, the U.S. Defense Department plans to apply AI to virtually every aspect of its operations “to ensure an enduring competitive military advantage against those who threaten our security and safety,” according to strategy document released Feb. 12²⁴⁹.

Due to the efforts within China and Russia to develop autonomous systems, artificial intelligence (AI), and hypersonic weapons and to counter it in expected future wars, the Pentagon has requested a higher budget to reinforce the U.S.A artificial intelligence defense system in all domains: air, land and sea²⁵⁰.

Considering these key elements in regards to the proliferation in AI, Autonomous Systems, and the reaction of the U.S.A, evidence indicates that a race in the developments of this technology is already occurring. With regards to the plausible existence of an arms race in AI, or other advanced technology, how is the U.S.A, the current world leader preparing for ascending super powers?

4.9 U.S.A Third Offset Strategy – Plan for competition

In response to China and Russia’s advanced military developments, in 2015 the U.S.A introduced its Third Offset Strategy²⁵¹. Following the two first offsets strategies that occurred during the Cold War, U.S.A 21st century strategy seeks to

²⁴⁷ *ibid*

²⁴⁸ (Johnson, 2019).

²⁴⁹ (Klare,2019,p.2). *AI Arms Race Gains Speed, Arms Control Association*

²⁵⁰ (Klare,2019,p.1). *Pentagon Asks More for Autonomous Weapons, Arms Control Association*

²⁵¹ (Boulainin and Verbruggen, 2017,p.59).

maintain its strategic superiority by embracing the AI technology that holds the key component for a new military sphere – Autonomy²⁵².

Whilst the first offset strategy, was to battle against Soviet conventional military advances, by investing in nuclear, and atomic technological developments, the second offset strategy was introduced to imbalance the USSR by developing projects with precision-guided munitions, long-range/stealth aircraft, intelligence, reconnaissance, and surveillance platforms technology²⁵³. In result, studies based on Chinese expert literature found that China has paid great attention to the Third Offset Strategy and has started to formulate possible reactions²⁵⁴. Furthermore, as per SIPRI (2017), a review of the debate in China on the Third Offset Strategy concludes that Chinese experts think that the strategy is²⁵⁵:

- a). Trap to drag China and Russia into harmful technological competition;
- b). Hoax to cover the USA's weaknesses;
- c). Competitive strategy to strengthen US dominance;

Some Chinese analysts have indicated the strategic choice that China should make in response by suggesting improvement in China's management defense industry and the developing key elements of unmanned systems, AI for military applications, and countermeasures to US technologies (e.g. soft-kill measures against unmanned systems)²⁵⁶.

With this said, these reactions seem to imply that a security dilemma effect is occurring due to the offset strategy. However, as per Ruud (2019, p38), there is no

²⁵² (Boulainin and Verbruggen, 2017,p.58).

²⁵³ (Kempf, 2017,p.94).

²⁵⁴ (Boulainin and Verbruggen, 2017,p.60).

²⁵⁵ Ibid,p.61

²⁵⁶ Ibid.p.37

reason to imply a China-U.S.A Cold War yet. Whilst the first Cold War was predominantly disputed through arms races and proxy wars, the New Cold War shall be battled directly, transnationally, through industrial competition and cyber warfare in a no longer bipolar world but instead tripolar²⁵⁷.

Conclusion

My study aimed to explore if China's rise as a superpower, and its goals to become a world leader in Artificial Intelligence are plausible drivers to represent any threat to peace, and security.

One of the main reasons to consider this hypothesis and its dangers is due to how the U.S.A may react due to fear in being displaced from its global supremacy from a rising power. Another reason, is because Artificial Intelligence has the potential to challenge the balance of power between superpowers, to reform the concept of warfare, and military strategy as it represents a new resource that will allow states to maintain, and work on their geopolitical preeminence.

Considering this and the superpowers gradual dispute patterns during the Cold War and the 21st century Sino-US relations, the nature of my data seems to indicate an initial technological race in AI between China and the U.S.A in which both parties have already recognized each other goals and motivations.

Needless to say, this study presents that in realism perspective states will do what is necessary to protect their sovereignty and seek for hegemony whether as a result of direct or indirect threat. Furthermore, there are many factors that drive a nation to pursue its global influence. However, besides the main political agenda of

²⁵⁷(Doyle, 2018,p.3).

any nation to achieve its goals, whether economically, geopolitically or military, one must not be ignore as it is the main core of a nation's pursue – to live and survive.

For this reason, one recommendation for further study would be the research into the further developments of autonomous weapons and systems. Without further analysis, in particular, within the strategic studies, it will not be possible to conclude if China and the U.S.A will engage to a next stage of arms race where these technologies will be put to test on warfare scenarios at a large scale posing a menace to the peace.

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List of figures

Figure 1: Leading countries contributing for AI surveillance.....	29
Figure 2: AI surveillance technology of origin.....	30
Figure 3: China’s New Silk Road	38
Figure 4: Military expenditure between the U.S.A. and USSR – 1949-1991	46
Figure 5: The U.S.A and USSR GDP Growth.....	47
Figure 6: The share of world military expenditure with the highest spending in 2018.....	56
Figure 7: China – U.S.A military expenditure.....	57
Figure 8: Annually published AI papers on Scopus by region (1998-2017).	59
Figure 9: Papers by sector affiliation	60

List of tables

Table 1: Successive records for size of swarm of fixed-wing UAV (all military).....	23
Table 2: Successive records for size of swarm of rotary-wing UAV (all civil).....	24
Table 3: GDP at PPP rankings.....	32
Table 4: Total Lunar Spacecraft Attempts by Nation/Agency 1958-2016.....	39
Table 5 : Thucydides’s Trap 15 Case Files.....	51
Table 6 : Participants at a Major AI Conference.....	58