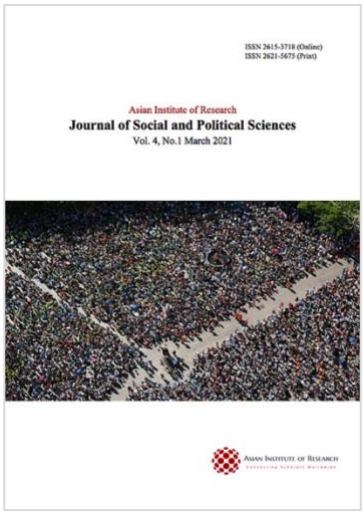

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The CCP's Development of Artificial Intelligence: Impact on Future Operations

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Abstract
The development of artificial intelligence and related technologies has a potential serious impact on the industrial development and the military operations. The Chinese Communist Party has also classified this area as a key direction of the future development, hoping that in this new wave of military affairs innovation, under the absolute superiority of economic and military affairs, China could surpass the United States in one fell swoop, changing the world situation in which the United States is the only military superpower since the end of the Cold War. In the report of the 19th National Congress of the Communist Party of China, President Xi Jinping clearly stated that it should accelerate the development of military intelligence and strengthen the joint combat capability of the network information system, including the R&D of the innovative weapons and equipment. As Xi Jinping took over the presidency of China in 2013, he initiated the "dream of strong army". In the future, artificial intelligence is bound to be an important part of the CCP's military modernization, and it is also a foresighted preparation for winning the next war. At present, most of the CCP's research on military development in terms of artificial intelligence tends to be on hardware devices, such as automated combat vehicles, autonomous drones and remote-controlled submarines. These related technologies rely heavily on the mechanical engineering and traditional R&D. The CCP intends to combine the development of military science and technology with the advanced weapons as a means of "killer" conception for future regional wars against the United States and other major powers. In this concept, the Communist Army will carry out paralytic asymmetrical attacks to its potential enemies. In the past, the "killer" weapons may be the attack missiles that attack large ships, but now they may include a new generation of artificial intelligence weapons that use the big data, the Internet of Things, or the cloud computing. In the face of the development of the CCP's artificial intelligence militarization, not only we must concern about its current major developments, but also have to analyze the motives behind it, so that we can make correct judgments in the future operations to block the CCP's media campaign and arms deterrent. This is the focus worthy of our urgent attention.

Keywords: Artificial Intelligence, Dream of Strong Army, Asymmetric Combat

1. Introduction

In recent years, many military conflicts have broken out in the Middle East, especially in the countries such as the United Arab Emirates and Qatar. Although they are small countries in the region, they may have serious impacts on regional security. Their main means to achieve the goal is to use technology and invest a lot of

resources within the scope of ability. For example, the anti-Qatar coalition accused Qatar of using media such as Al-Jazeera Network to provoke hatred among Middle Eastern countries and undermine regional stability, resulting in an endless stream of terrorist attacks and ethnic antagonisms in the Middle East. Not only are there conflicts continued in the region, but also are there been continuation of terrorist attacks around the world. On the other hand, the United Arab Emirates can project its military power to distant countries such as Libya through mercenaries and a small amount of advanced technology assets. From these examples, we can see that when resources, technological capabilities, and political will are integrated, even a small country with few people can become an influencer in regional affairs.

The latest U.S. national security strategy clearly states that the CCP's growing technological strength has gradually played an important role in the key emerging technology fields, which has seriously threatened the U.S.'s economy and military power. The United States regards the CCP's technological development as the center of China's national defense strategy, because the technology can be applied interactively to both the military and people's livelihood, and it is likely to change the status of world power. The growing technological strength of the CCP has gradually narrowed the gap between the United States and China. Especially five years ago, the U.S. generally believed that the CCP was just a technology imitator, but now it has become an innovator in many fields. In particular, artificial intelligence will be the main key player in the competition between the two countries in the future.

The emergence of artificial intelligence has even more far-reaching impact on humans than other important technologies such as thermal power generation, because the technology can be applied to both the military and the people's livelihood, just like the technologies of aviation, aerospace and Internet, which can be used for space exploration. Artificial intelligence can also be a lethal weapon with a commanding height in outer space. Moreover, artificial intelligence can make subversive changes for both the military and the people's livelihood. As military facilities hided in the civilian population, it is usually used to facilitate people's lives and maximize economic benefits; meanwhile, it can be transformed into a key military force to protect people's lives, property, and safety.

2. The Development of Artificial Intelligence

The term "Artificial Intelligence (AI)" was first proposed in a seminar held in Dartmouth in 1956 by John McCarthy, the father of computer high-level language LISP, who organized the meeting. Artificial intelligence originally belonged to part of the field of computer science. Later, due to its application level, it became more popular, and the disciplines such as psychology and philosophy were added to allow machines to have the same thinking, logic capabilities and behavior patterns as humans. Artificial intelligence includes a very wide range of sciences, which is composed of different fields. The development processes include learning, perception, reasoning, self-correction, and how to manipulate or move objects. Artificial intelligence is a new technological science related to the theories, methods, and application systems used to simulate, extend and expand human wisdom. In other words, it attempts to understand the essence of wisdom. The development of artificial intelligence includes speech recognition, computer vision, expert systems, etc. Generally speaking, one of the main goals of artificial intelligence research is to make machines capable of some complex works usually required human intelligence. But different times and different people have different understandings of this "complex work".

Artificial intelligence is changing our lives step by step. The future will be a world in which humans and machines coexist. Looking back at the origin of artificial intelligence, it has a history of more than 70 years. Artificial intelligence can be classified as a branch of computer science, while it is diversified in various academic fields, where the controversial definitions between "science fiction" and "reality" are often argued. As early as the 1950s, scientists began to study artificial intelligence, which can be traced back to philosophy, fiction and imagination, mainly focusing on the solution of academic problems or chess games. By the 1970s, scientists began to study theoretical concepts and incline to practical application issues. Modern machine functions that are usually classified as artificial intelligence include: successful interpretation of human voice,

face recognition systems, military simulation war games in strategic systems, and unmanned vehicles. (Allen and Husain, 2018)

General speaking, artificial intelligence can be divided into two types. The artificial intelligence that performs specific tasks belongs to “weak artificial intelligence”; the other type is “strong artificial intelligence”, also known as “artificial general intelligence (AGI)”, capable of imitating human thinking, decision-making, self-consciousness, autonomous action, etc. At present, this category mainly appears in science fiction movies and film collections and has not yet become a scientific fact, but this is also the goal that scientists are trying to achieve.

There have been three “booming periods” in the history of artificial intelligence. Since mankind invented the first computer, the development of artificial intelligence has begun. It has been more than half a century, and there are certain technical obstacles that cannot be broken through, and every boom has its reasons and difficulties encountered. The history of various development stages of artificial intelligence are briefly described in the following three sections.

2.1 The First Boom (1950~1960)

Alan Turing—a British computer wizard, cryptographer, and logician, also the father of computer and artificial intelligence—proposed the idea of “Turing Machine” in 1936, which was a kind of mathematical logic machine. His invention successfully cracked the Enigma Code of German army during World War II. In addition, in 1950, Turing published "Computing Machinery and Intelligence”, focusing on the systematic discussion and in-depth thinking of the machine in imitating human intelligence, and the machines that can behave the same as human beings in thinking and making decision. This famous experiment on judging whether a machine can think or not was the so-called "Turing Test."

Artificial intelligence mainly began to develop in the 1950s, mainly through the use of computers to deal with complex problems and further search for data and infer results. The term "Artificial Intelligence" was introduced at Dartmouth College in New Hampshire on August 31, 1956 in a summer meeting of artificial intelligence research project, of which the proposal was written by John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon. The participants in the seminar agreed that artificial intelligence could be used as an independent subject, so this year might be said to be the first year of artificial intelligence. People were eager to use computers to solve problems, but computers were built through mathematical logic. With computing power at the time, complex problems often could not be solved. Therefore, the application was mainly oriented to algebraic problems and mathematics proof. However, since 1974, artificial intelligence had not made important breakthroughs, mainly because computer was trapped in the limited data access and the slow processing speed. Moreover, the actual application level was not as wide as imagined such as to answer human-specific questions, for the lack of software, hardware, and data information, so it gradually tends to ebb.

2.2 The Second Boom (1980～1990)

Beginning in the 1980s, statistical thinking had brought artificial intelligence to life, mainly by inputting a large amount of expert knowledge into the computer. The accumulation of data and knowledge promoted the progress of computer learning algorithms, so that the machine could use its own experience to automatically adjust programming, resulting that the application of artificial intelligence was advancing by leaps and bounds, such as fingerprint and voice recognitions. The computer judged the answer according to the user's question. The dualism that originally judged whether something was true or false had added the concept of quantification. In 1984, Hopfield—professor of Princeton University, physicist, molecular biologist, and neuroscientist—used analog integrated circuits to successfully propose a neural network model, which enabled further breakthroughs and progress in deep learning. The first expert system DENDRAL was also born in this era. For example, it was used in disease diagnosis and discrimination. If the system made a mistake in judging a continuous problem, it would get a wrong result. Therefore, the expert system was composed of a large number of knowledge data and reasoning rules stacked to simulate complex problems that could only be solved by domain experts, but its application scope still had limitations, coupled with the discontinuous advancement of computers, the expert

system was gradually going downhill. Because knowledge is endless, it is impossible to input all knowledge into the computer and find out the sequence of all knowledge, so expert system became impractical in the end. Since 1987, artificial intelligence had reached another low point. Because artificial intelligence cannot endlessly pursue ideals, it must be made more practical otherwise it will eventually become a bubble.

2.3 The Third Boom (2000～Present)

After entering the 21st century, due to the advancement of semiconductor technology and the improvement of computing power, many artificial intelligence capabilities even have exceeded the work that humans can do; and because of the decline in semiconductor costs, the use of cloud storage has become cheaper and more common. The cloud server collects "big data" from all over the world. Among them, machine learning is to train and memorize computer's "learned" data through "big data", while deep learning is further through "big data" to train the computer to "understand" the data on its own to establish a good foundation for the development of artificial intelligence.

Due to the advancement of semiconductor technology and the decline in costs, the storage and calculation of large amounts of data have become easier, and an excellent environment for the development of artificial intelligence has been provided. Therefore, all countries are pursuing the fruitful goals that the artificial intelligence can bring; on the contrary, will the excessive development of artificial intelligence have a negative impact on us one day? Or just like nuclear energy can generate convenient and abundant electricity to people, but if it misused to become a bargaining chip for rogue countries or terrorists, a nuclear crisis might happen at any time.

3. The Development of Artificial Intelligence in CCP

On July 20, 2017, the State Council of the Communist Party of China announced the "New Generation Artificial Intelligence Development Plan", which stated its ambition to become an artificial intelligence leader in the world by 2030. The plan proposed the guiding ideology, strategic goals, key tasks, and guarantees for the development of the CCP's new generation of artificial intelligence. It is hoped that the CCP will have an absolute advantage in the development of artificial intelligence in the future. According to this plan, the CCP will invest 150 billion U.S. dollars (1 trillion RMB) in the next few years to build up CCP's artificial intelligence industry, including brain neural network architecture and quantum machine learning. It hopes to use national resources to promote internal innovation and continuous improvement, including big data, group intelligence, human-machine hybrid intelligence, etc. In addition, the plan also lists education and recruitment of top talents as well as hardware innovation as key development items.

The leaderships of the Chinese Communist Party believe that this plan can help it grasp the "significant strategic opportunity" for the development of artificial intelligence, and ultimately achieve its goal of surpassing the United States. The expected application range of the next generation of artificial intelligence technology in the future also includes command and decision support in national defense, military games, and military equipment development. This plan is expected to promote the next generation of artificial intelligence with disruptive and remarkable effects, thereby accelerating the CCP to become an innovative country and a world technological power.

3.1 Four Major Advantages for the CCP in the Development of Artificial Intelligence

3.1.1 Policy Advantages

The CCP positioned artificial intelligence as a national strategic goal in 2017, and it has become a policy task, to which the government and private enterprises pay a great attention. The "New Generation Artificial Intelligence Development Plan" announced by the State Council of the Communist Party of China in July 2017 can be divided into three stages. The first stage will be ended by 2020, the overall artificial intelligence technology and

application will be synchronized with the world's advanced level, and the artificial intelligence industry will become a new important economic growth point for China, while the application of artificial intelligence technology has being become a new way to improve people's livelihood; the second stage is to achieve the major breakthrough in the basic theory of artificial intelligence by 2025, and some technologies and applications will reach the world's leading level. Artificial intelligence then will become a main driving force for upgrading industry and transforming economy, whereby the smart society will make positive progress on building a global high-end value chain. In the final third stage, it is estimated that by 2030, artificial intelligence theory, technology and application will surpass the United States, lead the world, and become the world's major artificial intelligence innovation center in military, governance, medicine, and agricultural application technologies.

3.1.2 Investment Advantages

According to a survey of CB Insights, the global financing for artificial intelligence startups reached 15.2 billion US dollars in 2017, of which Chinese companies accounted for 48%, surpassing the US's 38%. The CCP once invested a lot of money in "Sense Time," an AI startup that focused on image recognition. In July of that year, it raised US$410 million, setting a record for a single round of financing investment in the global market of artificial intelligence. This is the first time that the CCP surpasses the United States in terms of the startup financing investment, and it has grown substantially from the CCP's 11.6% share in 2016. This has to be attributed to the CCP's use of the entire national power. The CCP government has the power to manipulate the market and the financial budget that is not supervised by taxpayers. It uses hundreds of millions of dollars to finance CCP's artificial intelligence enterprises, and strongly supports the development of face recognition technology and artificial intelligence processor. In addition, Xinhua News Agency reported that in 2018, the CCP's defense budget approved by the two sessions would increase 8.1% to more than 1 trillion RMB, part of which would be invested in artificial intelligence and other military technologies.

3.1.3 Data Advantage

Mainland China has the largest population in the world, about 1.4 billion. The massive big data collection system enables the Chinese Communist government to closely monitor the online activities of hundreds of millions of net citizens, holding the detailed files and data of more than a billion people, and recording every move of the people from time to time through countless surveillance camera lenses. Data is a key element on operating artificial intelligence. These huge amounts of data can be utilized, analyzed, and applied by artificial intelligence companies. Artificial intelligence is to train and test algorithms through data, enabling the adaptation of a new environment or learning the new skills independently without being driven by human will. (Galliott et al., 2018)

Moreover, most large cities in mainland China have established artificial intelligence research institutes, which can share data with each other. Therefore, the CCP can easily collect data for any application scenario it needs. These data are strictly controlled by the Chinese government, so it is easy to obtain the information and the cost is low. The CCP's artificial intelligence can make amazing progress under the leadership of the government.

3.1.4 Technical Talent

From the perspective of competitiveness, mainland China is embarking on a battle for artificial intelligence talents. It not only involves the global leadership in artificial intelligence, but also the right to control the future of the world. From the perspective of talents, experts argue that mainland China has a large population of hardworking talents. It is estimated that nearly half of the promising opportunities for the global investment of artificial intelligence are in the mainland China. The CCP urgently needs about 5 million high-quality artificial intelligence talents. In order to gain the leading position in artificial intelligence, the CCP not only spent 13.8 billion RMB to set up an artificial intelligence industrial park in Mentougou, Beijing, the State Council also planned a route map of artificial intelligence, appealing the strengthening of artificial intelligence education in primary and secondary schools, and hoping to become a world hub of artificial intelligence.

From the progressive view point of the key technology of artificial intelligence, the CCP has gradually gained some advantages. For example, the number of research papers related to "deep learning" had surpassed the United States in 2014. As of 2016, the number of artificial intelligence patent application had reached 15,745, placed second in the world. In order to snatch artificial intelligence talents, mainland China not only recruits experts and scholars from well-known domestic universities, but also focuses the Silicon Valley of the United States, Toronto of Canada, and other hot spots where artificial intelligence talents gather. Microsoft has established a research institute in Beijing, and Google has also placed an artificial intelligence research center therein, actively planning the recruitment of artificial intelligence talents, hoping to find the top talents from the CCP and all over the world. Although there are many obstacles in the recruitment of talents, major countries around the world have fully enforced the battle plans to grab excellent talents. However, the CCP has already achieved initial fruitful results for the future development of artificial intelligence under the vigorously efforts made by the state machinery. Among the top 30 patent applicants, there are four academic institutions, of which China owns three, and the Chinese Academy of Sciences has more than 2,500 patents, ranking 17th. Seventeen of the top 20 academic institutions for artificial intelligence patent applications are from mainland China, and 10 of the top 20 scientific publications related to artificial intelligence are from mainland China. These fruitful results can never be accumulated in one or two days. It is the fact that the CCP is making every effort to take the lead in artificial intelligence issues, and then to have the dominant power.

3.2 The CCP's Purpose and Attempt to Pursue the Development of Artificial Intelligence

3.2.1 Hope to Use AI to Enhance Economic Competitiveness and Military Capabilities

The CCP hopes to lead other countries in artificial intelligence and use it to gain more economic and military advantages than its competitors. By 2030, artificial intelligence is expected to contribute US$13 trillion to US$15 trillion in the global economy. At the same time, artificial intelligence can accelerate the speed of scientific development. In 2019, the performance of artificial neural networks had been significantly superior to that of the key task of biological research; namely, the existing methods of protein folding.

Artificial intelligence will also thoroughly change the patterns of warfare. It can improve the visibility of soldiers on the battlefield and become the commander's best intermediary to make decision and communicate order. Artificial intelligence systems can process more information and execute faster than humans, so they are the best tools for real-time assessment in chaotic battle conditions. On the battlefield, machines move faster than humans, and have better accuracy and coordination.

There is a real-time strategic game called "AlphaStar", which deploys artificial intelligence and humans as two sides of competition. During the game, the AlphaStar artificial intelligence system can quickly process a large amount of information with accurate coordination, and quickly dispatch the units to show its superior ability to humans’. These advantages will enable artificial intelligence systems to manipulate swarmed robots more effectively than humans. Human beings will maintain their advantage at a higher strategic level, while artificial intelligence will dominate practical applications.

3.2.2 List Artificial Intelligence as the Highest Priority of National Power and Combat Power

President Xi Jinping of the Communist Party of China requires the army to win in future wars. For the Chinese Communist Army, it seeks to increase the authenticity and complexity of actual combat drills and adopt new technologies in exercises and training, including the use of virtual reality technology and the creation of actual combat mentality. The Chinese Communist Army is exploring the virgin land of military innovation. Specifically, artificial intelligence is regarded as a key strategic technology, and the information-based warfare will be transformed into intelligent warfare in the future. The importance of artificial intelligence can be seen from its inclusion in the work report of the Chinese Communist Party Premier Li Keqiang in 2017. Future warfare requires rapid, decisive, and continuous cycles of execution in all aspects, from intelligent analysis to

artificial intelligence operations and decision-making support, and finally it may involve human decision-making. Artificial intelligence will speed up the process of detection, decision-making, and action infinitely. This process will even involve human control systems and semi-autonomous systems. Therefore, no matter which field a country develops in the future, it is inseparable from the high-efficiency development brought about by artificial intelligence to achieve the goal of maximum successful calculation.

3.2.3 Become the World's Leader of Artificial Intelligence in 2030

The CCP has the largest population in the world. In order to push this giant ship ahead, it must rely on the revolutionary progress brought about by artificial intelligence. Accordingly, the CCP's investment in artificial intelligence could be said to be sparing no effort. Five of the ten artificial intelligence startups with the strongest capital in the world in 2017 were from mainland China. The Chinese mainland technology giants Alibaba, Baidu and Tencent are just on par with Amazon, Google, and Microsoft, ranked amid the world's leading artificial intelligence companies. The CCP's pledge to become the world's leader in artificial intelligence by 2030 is approaching to the realization step by step.

3.2.4 Xi Jinping Consolidates Internal Power

In the beginning of 2018, the CCP used a monitoring system combined with big data analysis technology to trace each mainlander's Internet activities, shopping patterns, protest participation, business and legal behaviors, as well as other personal information to ultimately establish a "social credit" scoring system or standard. The purpose is to evaluate the people's loyalty to the country. If the "social credit" score were below the standard, then punishment would be executed directly. For example, these people will be punished by refusing loans or banning domestic and foreign flights, which directly cause inconvenience in their lives.

Because the surveillance system for the comprehensive monitoring of 1.4 billion people requires the analyses of extremely large amounts of data, it is impossible for humans to take the tasks of surveillance, collection, interpretation, and evaluation. Instead, they must rely on autonomous operations processed through artificial intelligence algorithms. The CCP intends to export dual-use products that fulfill the both military and civilian purposes to the foreign countries. In order to consolidate the stability of their regimes, some governments hope to obtain a similar system that can monitor people's activities to detect signs of suspicious activities and prevent the emergence of anti-government events.

The National People's Congress of the Communist Party of China passed the constitutional amendment proposal with a high vote rate, and Xi Jinping's term of office could thus be re-elected indefinitely. And the CCP's monitoring of the people has gradually increased. The CCP uses artificial intelligence to monitor people's activities and also begins to export related technologies. In 2018, Zimbabwe signed a contract with a Chinese mainland cloud technology company to establish a national face recognition database. The face recognition surveillance systems are set up at airports, railway stations, and bus stations. The content of the contract is not only about money, Zimbabwe has even agreed that Yunsong Technology may send millions of facial data back to mainland China to help the company build files and improve the face recognition technology of dark-skinned people. The CCP also plans to sell surveillance technology in Malaysia, Mongolia and Singapore.

4. The Military Development of The CCP's Artificial Intelligence

In the report of the 19th National Congress of the Communist Party of China, President Xi Jinping clearly proposed to accelerate the development of military intelligence, strengthen the joint combat capabilities of the network information system, the global combat capabilities, innovative military theories, and develop new weapons and equipment. He regarded artificial intelligence as the future element of national military capability. As Xi Jinping put forward when he took over the presidency, the goal of "Dream of Strong Army" aimed to build a powerful People's Liberation Army into a world-class army to prepare ahead of time for winning the next war, while artificial intelligence is bound to be the most important part in CCP's active promotion of military modernization. In the military environment, information technology and weapon systems with artificial

intelligence are the key factors of victory on the battlefield. Russian President Vladimir Putin delivered a speech to one million Russian students on September 1, 2017, believing that countries leading in the development of artificial intelligence will dominate the world, and boldly pointing out “AI leaders will become the rulers of the future world”. This viewpoint is a global consensus, and more than a dozen governments have announced artificial intelligence initiatives. The State Council of the Communist Party of China announced the "New Generation Artificial Intelligence Development Plan" on July 20, 2017, clearly stating its ambition to become a leader of artificial intelligence in the world by 2030. The United States also announced an artificial intelligence initiative, and the Department of Defense subsequently launched an artificial intelligence strategy. Regarding the CCP’s application of artificial intelligence to the military level, we will discuss the following aspects.

4.1 Maintaining Domestic Political Stability

In 2013, the State Council of the Communist Party of China released the "Outline of the Social Credit System Construction Plan (2014-2020)". And following the first announcement of the "Social Credit Plan" in 2014, the State Council launched the plan to comprehensively implement the "Social Credit Score System" by 2020, in which the behaviors and credibility of 1.4 billion Chinese people will be observed, recorded, and analyzed. Through the system, the people's criminal records, financial information, Internet dialogues and other transactions are recorded and scored, aiming to achieve the purpose of overall monitoring. Those with low credit scores in the system will be punished and restricted in a variety of degrees.

In 2017, the CCP’s budget for maintaining political stability in the country reached US$196 billion, a 12% increase compared to 2016. This budget growth mainly lies in the preparation of new data platforms, such as high-end computers and high-definition camera lenses to analyze the potential dangers of people, so as to quickly grasp and accurately control the relevant information. Through minimizing the dangerous activities, the absolute prestige of the Chinese Communist Party over the country is then secured.

In order to achieve a comprehensive and constant surveillance, it must rely on various expertise of artificial intelligence. The CCP uses artificial intelligence as a tool for maintaining the stability of its internal regime. It can use deep forgery to slander those who disagree with the regime. The facial recognition system can perform all-weather large-scale surveillance. The predictive analysis can further identify potential troublemakers. For example, the CCP’s large-scale repression to Uyghur Muslims in Xinjiang often uses surveillance systems to closely monitor the activities of Uyghur Muslims. Currently, nearly 80 cities in mainland China use smart camera surveillance systems. They are also beginning to use data analysis, facial recognition systems, and predictive systems to predict the criminal activities. The CCP uses an extensive network of surveillance cameras linked with algorithms to detect abnormal public behaviors. According to statistics, about 6,000 incidents related to "social governance" were discovered. Those who were deemed unsafe by the system were forced to be unable to participate in daily activities, and many were even sent to re-education camps.

4.2 A New Wave of Arms Race

The Communist Army delves into the development of artificial intelligence to strengthen its future combat capabilities. At the beginning of 2017, the CCP established the Central Military-civilian Integration Development Committee to promote the "Military-civilian Integration Strategy". The results obtained from the civilian industry are used at military operational level. The high-tech development is recognized as a new wave of military affairs innovation, and it is asserted that the future high-tech applications of related artificial intelligence will impact the current military power layout. Artificial intelligence will become an indispensable part of "information war". At the same time, it will shift the form of war to the direction of "intelligence." The CCP believes that "intelligence" has brought a new wave of information revolution. In the future, artificial intelligence will completely change the economic and military affairs in the existing world.

For each country, whether artificial intelligence becomes a new wave of arms race and brings major risks is not the main point, but the perception of the arms race brought up by that artificial intelligence lags behind

competitors will prompt countries rushing to use unsafe artificial intelligence systems. Basically, the risk faced by each country is the same as that of its opponents.

The CCP hopes that it can compete with the United States in terms of military innovation in the future, and artificial intelligence is its weapon for future development, and it is a necessary development direction. For the future, not only does China worry that it will form another "generational gap" with the US military in terms of combat power, but also does it hope that it will be able to win further battles with the US military. Therefore, when understanding the importance of grasping today's technological trends, China makes up his mind to reduce the gap between the United States as soon as possible by "actively promoting military affairs innovation", aiming at the existing U.S. military innovation plans to achieve own goals of "mechanization" and "informatization" necessary for the modern warfare. These are the things that the Communist Army is most concerned about and most necessary to do.

4.3 "Smart" Operations

At present, most of the CCP's research on military development in terms of artificial intelligence tends to be on hardware devices, such as automated combat vehicles, autonomous drones and remote-controlled submarines. These related technologies rely heavily on mechanical engineering and traditional research and development. The CCP intends to combine the development of military science and technology with advanced weapons as a means of "killer" conception for future regional wars against the United States and other major powers. In this concept, the Communist Army will carry out paralytic asymmetrical attacks to its potential enemies.(Bruzdzinski, 2004) In the past, the "killer" weapons might have been attack missiles that attack large ships, but now they may include a new generation of artificial intelligence weapons that use big data, the Internet of Things, or cloud computing (Scharre, 2019).

While the Chinese Academy of Military Sciences is carrying out reforms, another forward-looking action is to integrate the new technologies of the Communist Army, i.e., the so-called "intelligent operation". Although the concept is still in the development stage, an article from the official Chinese media Xinhuanet has defined "intelligence operation" as follows: in a battlefield environment, "intelligent operation" is a high-tech integrated with artificial intelligence as the core, where science and technology can penetrate into combat command, equipment, tactics and other fields. The core concepts can be understood and grasped from the quotation of "intelligence is essential, ubiquitous cloud connection, multi-domain integration, brain-computer integration, intelligent autonomy, and no one competes."

It predicts that the emergence of "intelligent operation" will have a huge impact, and we may point out that this new type of warfare will "break through the limits of traditional time and space cognition", "reconstruct the relationship among people, weapons and equipment," and "incubate a new command and control method." The future decision-making method will shift from the traditional "human brain decision-making" to the "intelligent decision-making" dominated by artificial intelligence. The future "intelligent operation" will be a three-dimensional, full-field warfare. Unmanned systems that rely heavily on will greatly reduce the military's combat cycle of "observation, judgment, determination, and execution".(Wang and Dotson, 2019)

4.4 The Development of Traditional Weapons Combined with Artificial Intelligence

For many years, the Communist Army has converted the J-6 and J-7 jet fighters of the 1950s and 1960s into UAVs. By combining the outdated equipment, upgraded sensors, autonomous systems with artificial intelligence algorithms, these fighters fly through the enemy's airspace to be taken as the "first wave" of troops to waste the enemy's air defense missiles in a saturated attack mode, increasing the tactical success rate. For the U.S. Air Force, adding sensors and controllers to traditional weapon systems, such as Boeing's Joint Direct Attack Munition (JDAM) components to the unguided bombs, will making them become smart, accurate and GPS guided ammunition. The joint direct attack ammunition was very effective in the Second Gulf War.

The research results have been proved that machine learning can effectively integrate sensor data to improve the detective accuracy and the range of traditional weapon systems such as sonar. The integration of machine learning algorithms and data has greatly improved the capabilities of the old system resulted in a rapid, cheap upgrade operation. Moreover, because the software can be quickly improved, adapted and developed, the traditional system can be further improved without a long working period. But it also indirectly allows rogue countries or terrorists to acquire new capabilities/acceleration to upgrade existing weapon systems, and directly threaten neighboring countries and even hostile countries.

4.5 Future Development of 5G Technology

The CCP is also committed to making breakthroughs in 5G technology. It hopes that its 5G technology would lead the world and the information network based on 5G technology would be able to transmit large amounts of data at a significantly faster speed. Similarly, the aforementioned quantum science that strengthens military sensors will also change the communication and computer computing capabilities. Quantum computing—using the anomalous properties of subatomic particles to increase the processing power at an exponential rate—may make encryption methods unbreakable, and enable the military to process large amounts of data and solve problems beyond the capabilities of traditional computers. Even more incredible is that the so-called brain-computer interface (BCI) technology has enabled humans to use neural signals to control complex systems, such as robotic prostheses and even drones.

4.6 Future Tactics and Guidelines Revision

In terms of the future direction of the Communist Army's weapons development, in addition to science and technology, there are more factors that need to be considered. For example, what are the tactics and guidelines that accompany science and technology? Are the military thinkers and academic institutions of the CCP solving the complex problems of integrating new technologies into combat operations? The most notable example is the Chinese Communist Academy of Military Sciences, which is the Communist Army's primary standard development organization. It is currently focusing on major reforms and academic promotion programs to enable the Communist Army to be more appropriately integrated with the artificial intelligence, robotics and smart manufacture (Eastwood, 2019).

5. Conclusions

Science and technology are changing with each passing day. In the era of knowledge explosion, people are constantly seeking innovation in energy, computing and robotics technologies. The advanced technologies of many countries in the world have already changed the composition of entire defense industry. The development of artificial intelligence has been set as national strategic goal, and it has become an irresistible trend. After foreseeing the application prospects of artificial intelligence technology, the CCP believes that the future arms race will be an intelligent race.

5.1 "Military-civilian Integration" Creates the Greatest Advantage

The State Council of the Communist Party of China issued the "New Generation Artificial Intelligence Development Plan" in July 2017. The purpose is to create the advanced advantages of the Chinese Communist Party's artificial intelligence. The goal is to promote the CCP's artificial intelligence capabilities to a world-leading position by 2030, and use the opportunity of "military-civilian integration" to pursue the military development, especially strengthening the communications with related private enterprises, positioning artificial intelligence development as national strategy, and encouraging the United States to fully invest the most cutting-edge technology research in artificial intelligence. The competition of artificial intelligence between the United States and China has indirectly accelerated the development of military intelligence.

The CCP has successively planned to invest 60 billion U.S. dollars in a form of fiscal budget before 2025 to develop artificial intelligence technology in military security. Because artificial intelligence can analyze a large amount of data to propose a calculation model for decision-making and execution, Goldman Sachs predicts that the CCP can master a quarter of world's big data involving military security by 2020. "China National Defense News", a military newspaper, mentioned that The People's Liberation Army intended to use artificial intelligence extensively in the areas such as combat command, decision-making, exercises, and weaponry.(Kania, 2019)
The CCP has even attempted to use artificial intelligence weapons to attack US aircraft carriers. These plans have brought an urgent sense of crisis for the United States to focus the military affairs on the artificial intelligence R&D.

5.2 Artificial Intelligence Is Included in the National Defense and Military Field

Today, major military powers have incorporated the development of artificial intelligence into the national defense policy. Future military conflicts are no longer based on human intelligence to think about strategies and man-made operating systems. Instead, both offensive and defensive parties are trained in advance, so the both sides can conduct computer offensive and defensive exercises to acquire an optimum solution. However, in addition to the improvement of weapon software and hardware, the R&D of cloud computing and various artificial intelligence involving military should also be accelerated. In the era of digitalization, the traditional weapons are inferior to the unmanned weapons.(Brose, 2019)

It is a crucial issue for a country to apply artificial intelligence as resources to effectively respond to a wide range of domestic security tasks, including protecting infrastructure from terrorist attacks, performing border patrols, and even "against Internet rumors that may threaten social stability." Discussions on "intelligent" warfare are not started just now, but the Communist Army has been discussing this aspect more frequently in recent years, for example, how to integrate artificial intelligence into future military operations to allow the Communist Army to acquire information and command advantages in the battlefield, how to effectively implement conflict escalation management in future armed conflicts, and how to effectively achieve "war control" when there is a military conflict with another power or an important regional opponent.

5.3 "Smart" War

In a military environment, information technology and weapon systems with artificial intelligence are the key factors on the battlefield. In recent years, information warfare has been the main axis discussed in various writings of the Communist Army; however, this main axis will be replaced by the new main axis of "smart" warfare. Certain military decision-making will tend to be automated, changing decision-making methods from "human brain decision-making" to "intelligent decision-making". In the future wars, artificial intelligence can quickly predict the battlefield situation accurately, innovate the best combat strategy, and even achieve the war goal of "winning without a fight".

In an authoritative strategic thinking publication "Strategy" issued in 2013, the Communist Academy of Military Sciences mentioned "war control is the ability to accurately control the intensity and range of combat in order to achieve the desired national goal of war". In this military policy, the prediction and the management of the opponent's reaction are crucial. The Communist Army describes the development of successful combat operations control as a transition from single-oriented control to dual-oriented control. That is, the Communist commander not only controls his troops, but also attacks the enemy's weapons and information systems, resulting in a restrict on the enemy's choice of combat to exert a certain degree of control over the enemy. Therefore, the Communist Army has begun to discuss the need for dynamic combat operation control in response to the evolution of battlefield conditions in real time, in other words, using various information systems to synchronize combat operations to achieve "instant integration" of the battlefield decision-making process to effectively manage the geographically diffused forces switched between the offense and the defense to disperse the fog of war. For any commander, these are extremely difficult challenges. In the war under the conditions of

information technology, both parties are trying to exercise such control. The Communist Army believes that the party with the superior technological foundation will win the battle.

The concept of communist war control relies on a premise that the communists can achieve the desired results by raising conflicts within the acceptable costs to reach the point where the world has "safe for war". However, this is exactly what the Communist Army expects to be achieved through superior technology. The exploitation of advanced artificial intelligence technology can achieve two-way and dynamic control.

5.4 "Artificial Intelligence" Creates the Next Wave of Military Affairs Innovation

The U.S. Department of Defense defines "military affairs innovation" as "new technologies combined with combat concepts and organizational adjustments are integrated into the military system, fundamentally changing the characteristics of military operations." Since the Gulf War, military affairs innovation has opened a new chapter, and now it has entered a transitional period. The next wave of military affairs innovation is in its infancy, because the current technological development of big data, algorithms, artificial intelligence, and robots is undergoing. In the future, the type of warfare will begin to change, and the assumptions of intelligent warfare have gradually become in line with reality, rather than the unconstrained imagination as previously thought.

Emerging technologies will change the strategies and characteristics of warfare in the future, but the nature of war will remain the same, which is full of violence, chaos and uncertainties, and which is driven by human conflictive will and political factors. The picture of future warfare has begun to take shape, and the future battlefield will have the characteristics of winning by quantity, because technology has created many machines that are operated in a low-cost manner, and more weapon systems can be autonomously moved and deployed around the battlefield. As for the original tonnage weakness in logistics, it will become more flexible and efficient with the assistance of technology.

With the continuous improvement of science and technology, huge amounts of data are collected and analyzed, while machine deep learning and artificial intelligence have become an important part of modern joint warfare. The key force for decisive battles today is the degree of integration of a nation’s science and technology with the military affairs. Currently, major countries are paying more and more attentions to apply artificial intelligence in national defense systems, such as real-time evaluation, analysis and identification, with an overall aim to surpass the enemy through the enhancement of battlefield advantages.

Therefore, looking forward to the future military affairs innovation, the country can only understand this development trend of high-tech, and then use it in the professional field of national military information and intelligence. Moreover, we must always understand the strategic conflicts between international powers. Currently, on facing the future development of the CCP’s artificial intelligence militarization, we must not only pay attention to its current major developments, but also thoroughly understand the motives behind it, so that we can make correct judgments and create new ideas for military building and war preparations in the future to block the CCP’s media propaganda and military attack. This is the focus worthy of our urgent attention.

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References

Allen, John, & Husain, Amir. (2018). AI Will Change the Balance of Power. In: *proceedings of US Naval Institute*. https://www.usni.org/magazines/proceedings/2018/august/ai-will-change-balance-power

Brose, Christian. (2019). The New Revolution in Military Affairs: War's Sci-Fi Future. *Foreign Affairs*. https://www.foreignaffairs.com/articles/2019-04-16/new-revolution-military-affairs

Bruzdzinski, Jason. (2004). Demystifing Sha Shou Jian: China's'Assassin's Mace' Concept' in Civil Military Change in China: Elites, Institute and Ideas After the 16th Party Congress. *U.S. Army War College*, (pp. 309-364), http://publications.armywarcollege.edu/pubs/1686.pdf

Eastwood, Brent M. (2019). A Smarter Battlefield? PLA Concepts for 'Intelligent Operations' Begin to Take Shape. *China Brief*. https://jamestown.org/program/a-smarter-buattlefield-pla-concepts-for-intelligent-operations-begin-to-take-shape/

Galliott, Jai, & Scholz, Jason. (2018). Artificial Intelligence in Weapons: The Moral Imperative for Minimally-Just Autonomy. https://www.airuniversity.af.edu/Portals/10/JIPA/journals/Volume-01_Issue-2/04-Galliott-Scholz.pdf

Kania, Elsa. (2019). Learning without Fighting: New Developments in PLA Artificial Intelligence War-Gaming. *China Brief*. https://jamestown.org/program/learning-without-fighting-new-developments-in-pla-artificial-intelligence-war-gaming/

Scharre, Paul. (2019). Killer Apps: The Real Dangers of an AI Arms Race. *Foreign Affairs*. https://www.foreignaffairs.com/articles/2019-04-16/killer-apps

Wang, Howard, & Dotson, John. (2019). The 'Algorithm Game' and Its Implications for Chinese War Control. *China Brief*. https://jamestown.org/program/the-algorithm-game-and-its-implications-for-chinese-war-control/