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Artificial Intelligence and Robotics in the Chinese People's Liberation Army (PLA)

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Introduction

The desire to improve weapons and methods of warfare has accompanied humanity for centuries, and this improvement is inextricably linked to scientific and technological progress. A fundamental goal is to minimize casualties, and thus to design weapons that inflict losses on the enemy without endangering one's own soldiers.

One of the first devices used for military purposes in modern times was the Unmanned Aerial Vehicle (UAV), first deployed in July 1969 by Israel to reconnoiter Egyptian military positions (Katz, Bohbot, 2018). In the years that followed, Israel collaborated with the US, yielding remarkable results and revolutionizing the field of UAVs – reconnaissance, armed, and long-range. Currently being developed on a massive scale, they are divided into various types and constitute a separate branch of the military in many countries. The drive to eliminate threats to soldiers has

for years led scientists to focus their efforts on designing various types of systems capable of performing tasks controlled from a safe distance or even operating autonomously. As a result, conflicts in the 21st century deviate from the traditional concept of a clash between two opposing sides on the battlefield, conducted in accordance with the rules of the laws of war. This has not gone unnoticed in China either, where Colonels Qiao Liang and Wang Xiangsui presented the concept of Unrestricted Warfare, according to which the soldier of the future will also serve as a financier, computer hacker, smuggler and corporate employee, and the arsenal of weapons will additionally include computer viruses, web browsers, and financial instruments (Latiff, 2018).

A thorough observation and analysis of the profound changes taking place in the functioning of the US Armed Forces has resulted in a series of theoretical and organizational studies, as well as political decisions aimed at modernizing the Chinese army and equipping it with the capability to conduct military operations under conditions involving the use of so-called "highly advanced technologies". It is important to emphasize that one should not mechanically copy American solutions but rather apply one's own, combining "Western" technologies with "Eastern" wisdom (Kuberski, 2025).

The aim of this article is to present selected types of the most technologically advanced automated platforms (robots) which, enhanced with artificial intelligence, are capable of performing combat or support tasks on the battlefield either independently or in coordination with others. Given the vast scope of issues currently covered by the development and implementation of these systems in the Chinese People's Liberation Army, the author aims only to highlight the projects that are the most technologically advanced and have been formally unveiled. Furthermore, this is intended to provide the reader with an opportunity to compare the specifications and capabilities of these combat tools against the solutions currently fielded by the Polish military – solutions that have also been widely discussed in the media in the context of the ongoing armed conflict between the Russian Federation and Ukraine. The main research questions were formulated as follows:

1. What are China's main courses of action regarding the "*intelligentization*" of warfare?
2. In which domains (robotics and unmanned systems, C4ISR command-and-control systems) is China making the greatest progress?

In the research process, the authors focused primarily on collecting, selecting and analyzing available publications devoted to the subject. The methodology for researching the literature on the development of artificial intelligence and robotics in the People's Liberation Army of China employed an interdisciplinary approach combining security studies, data analysis and sinology. It is obvious that a number of barriers are present here, relating to data secrecy, deliberate disinformation and

language. Given the tremendous dynamism of change in this field, the most recent data contained in the following sources were used:

– official strategic and doctrinal documents of the People's Republic of China (China's Defense White Paper, the strategy of "intelligentization" of warfare, and the concept of civil-military fusion);
– academic literature and articles published by the Academy of Military Sciences of the People's Liberation Army of China;

Western analytical assessments monitoring the technological development of the Chinese military and its impact on the military's future combat capabilities.

The Level of Artificial Intelligence Development in the People's Republic of China (PRC) and its Implications for the Armed Forces

Artificial intelligence (AI) has become a field in which China has only one competitor – the United States. The rapid development of this field is evident not only in research, computer programs and translation tools, but also in practical applications, namely, identification, payments, intelligent robots and autonomous vehicles (Huang, 2024). The sinologist Bogdan Góralczyk has long emphasized the connection between the changes taking place in the country and the transformation of the armed forces. In assessing the PRC authorities' latest decisions regarding development plans for 2026–2030, he notes that the development of domestic innovation and technological self-sufficiency based on the advancement of artificial intelligence are fundamental tasks. It is worth noting, however, that a key aspect of this issue is the integration of the People's Liberation Army into the entire innovation mechanism, so that the Chinese military will be covered by technological self-sufficiency and all its objectives will be met on time (Góralczyk, 2025). These policy decisions have resulted in concrete actions related to the continuation of development work and the production of humanoid robots: a total of approximately $34 million has been invested in them, with the intention of using them in future military and support missions. Beijing is also accelerating research in the field of robotics and autonomous systems, aimed at reducing the number of fatalities in potential conflicts through the use of unmanned or humanoid units ("Η Κίνα επιταχύνει", 2026). These initiatives align with China's strategy to gain a technological edge in key areas such as artificial intelligence, robotics and autonomous combat systems, which are considered crucial for the wars of the future. Possessing a technological advantage means an advantage on the battlefield, and the use of artificial intelligence can be applied to the planning and preparation of operations, logistics and the effectiveness of combat operations. In many areas of the military sector, one can already find specific systems that incorporate solutions based on artificial intelligence. These include reconnaissance, data collection and analysis systems; innovative programmes proposing combat concepts and

presenting a vision of an action plan to political decision-makers and the military; specific command and control systems; and autonomous or remotely piloted combat platforms (Banafa, 2024). According to experts, all activities in this field are based on the 2019 White Paper on National Defense ("China's National Defense", 2019), which discusses the profound evolution currently taking place in modern methods of warfare. In the assessment of Chinese strategists, this evolution is moving from "informationized warfare" towards so-called "intelligentized warfare", which is emerging "on the horizon" as a new form of conducting military operations ("China's National Defense", 2019). A characteristic feature of this concept is the practical application of AI to existing military instruments, thereby influencing the development of new cognitive domains, which would revolutionize the existing concept of warfare ("Intelligentization", 2019).

Photo 1. Humanoid robot with dual-use capabilities



Source: Szutiak, 2026.

Example Scope of Work and Results Achieved at PLA

The Effects of the Dual-Use Concept for AI Technology

Artificial intelligence research in China is conducted in accordance with dual-use regulations, under which civilian technologies find military applications. This *Military-Civil Fusion* strategy enables China to pursue technological advancements related to commercial artificial intelligence for defence purposes. Examples include:

– Facial recognition and surveillance. Integrated surveillance systems based on artificial intelligence are used both for law enforcement and security purposes, as well as for military intelligence and counterintelligence, which has made it possible to virtually eliminate espionage activities.

– Autonomous vehicles. Research on autonomous vehicles is applied to unmanned aerial vehicles (UAVs), unmanned ground vehicles (UGVs) and autonomous maritime systems based on artificial intelligence for reconnaissance and combat purposes.
– Cybersecurity. Civilian applications of artificial intelligence in data protection are being exploited in cyberattacks and intelligence gathering (Bitzinger et al., 2021).

Unmanned Aerial Platforms

The development and deployment of military UAVs have been crucial for balancing and enabling PLA to conduct reconnaissance, surveillance and strikes. Airborne platforms would operate independently or in cooperation with manned platforms, providing flexibility while avoiding putting personnel at risk. This group includes the following categories:
– AI-enabled drones, commonly known as "Loyal Wingman", are designed to support manned fighter aircraft in reconnaissance, electronic warfare and strikes. The Chinese FH-97 design allows for autonomous decision-making and coordination during attacks;

Photo 2. China's Feihong FH-97A



Source: Saballa, 2024.

– drone swarms are being successfully deployed and, in most cases, are autonomous, using artificial intelligence for self-navigation, adapt, and assume formations in real time based on battlefield conditions, while simultaneously sending commands to one another, adapting to changes in threat perception, and processing threat data

based on applications. An example is the Atlas system, which combines features such as simultaneous mass launch, control of nearly 100 drones, and a single point of contact enabling control of all of them (Sihao, 2026). The Atlas system is based on land vehicles, while similar combat capabilities are offered by the Jiutian heavy jet drone from Hina, unveiled in late 2025, whose key task is to serve as a mother ship for swarms of approximately 100 smaller unmanned aerial systems. It was previously presented armed with various types of air-to-ground and air-to-air munitions, and according to the manufacturer's data, it can perform a range of other missions, including electronic warfare and logistics (Trevithick, 2025).

Photo 3. Flying "aircraft carrier" for drones



Source: Zawadzki-Liang, 2025.

– Drones with AI stealth technology, such as the GJ-11 Sharp Sword with artificial intelligence capabilities, which can perform autonomous reconnaissance and precision strikes. Built-in AI systems for target identification have been integrated with weapon systems to ensure high operational efficiency.

Photo 4. Chinese Stealth GJ-11



Source: Newdick, 2025.

Unmanned Maritime Platforms

As China rapidly strengthens its naval capabilities, it places great emphasis in this field on implementing innovative designs based on unmanned platforms and artificial intelligence. The primary designs include:

– autonomous surface multi-purpose vessels. An example is the Zhongshan-class unmanned surface vessel, designed for patrol, surveillance and electronic warfare missions, combined with swarm coordination capabilities, which allow multiple unmanned surface vehicles to operate in concert. The vessel has a displacement of approximately 200 tonnes, a length of over 40 metres, and a trimaran design; it reaches a maximum speed of over 20 knots, can perform tasks in sea state 5, and safely navigate in sea state 6 (Xuanzun, 2022).

Photo 5. Chinese unmanned patrol vessel



Source: Rychter, 2024.

– autonomous multi-purpose underwater vehicles. One example of a vehicle at an advanced stage of testing is the HSU-001 UUV, an underwater drone with built-in artificial intelligence, designed for underwater reconnaissance and anti-submarine warfare. Applications of artificial intelligence include its stealth capabilities in autonomous navigation and target engagement. Intelligence data indicates that work is underway on larger units capable of performing intelligence, surveillance and reconnaissance missions. Furthermore, the larger size should translate into a significantly greater range. This also opens up other possibilities, such as offensive mining, anti-submarine warfare and transport (Sutton, 2022).

Photo 6. HSU001 combat underwater drone



Source: Strachan, 2019.

Robotization and Autonomous Systems in Land Forces

The development of AI-supported autonomous systems is most evident in the land domain, specifically in the use of robots for ground operations: their mobility allows these systems to adapt to combat conditions while being equipped with reconnaissance devices, logistical support, and weaponry, including the capability for direct combat. The scope of research, development proposals and implementation of new inventions is so broad that the length of this article allows only for an overview of the main developments in this field:

- combat vehicles. Development efforts focus, among other things, on improving manned vehicles, an example of which is the Type 100 tank, which has a 3-person crew positioned outside the turret and is lighter than "Western" tanks – weighing 35 to 45 tons depending on the version – but is richly equipped with an extremely extensive set of sensors and an active defence system that protects it from drones, anti-tank missiles and grenade launcher fire ("World's first", 2026). Another area of development is autonomous combat vehicles, represented by the unmanned combat vehicle VU-T10, a nearly 11-tonne electric combat platform designed for the battlefield of the future, where military operations are conducted by robotic systems, and full automation and AI replace the human factor, which, according to the designers, is the most unreliable ("China tests", 2025).
- Multi-purpose autonomous vehicles. This encompasses a wide range of wheeled and tracked vehicles designed for versatile applications in combat, logistics, medical support and mine clearance; they can operate in either semi-autonomous or fully autonomous modes. An excellent example from this wide range of products is the Mule-200, a medium-sized, multi-purpose, tracked unmanned vehicle designed to support infantry units, transport ammunition and supplies, and armed with firearms to provide close-range fire support. An additional advantage of the vehicle is the ability to place sensitive payloads under the armour (Jiayao, 2020).

Photo 7. VU-T10 unmanned combat vehicle



Source: Sato, 2025.

Photo 8. Mule-200 multi-purpose unmanned platform



Source: "500 kg Crawler-type" (n.d.).

– autonomous robots. The rapidly developing field of humanoid and bio-inspired robots has found its way into the military sphere. The Chinese company South Industries Group Corporation presented an unmanned combat system integrated with four-legged "robo-wolf" robots at Airshow China 2024. Official reports indicate that this field is clearly dominated by Chinese scientists and engineers. The scenarios presented at the show, for example, coordinated operations involving swarms of drones, robotic quadrupeds and unmanned ground vehicles

working closely with soldiers. The exercises took place in a realistic urban environment, featuring skyscrapers, narrow passages and fortifications. Unmanned vehicles took on key tasks there, such as reconnaissance of dangerous areas and intelligence gathering, reducing the need to expose human resources to high risk. According to the soldiers participating in the training, it is no longer a test but established practice, demonstrating that the future of conflict is moving towards a hybrid model in which humans and autonomous systems operate as a unified whole ("Κίνα: Ο Στρατός", 2026). The latest data reveal that China is continuing the development and production of humanoid robots, investing a total of approximately $34 million, with the intention of using them in future military and support missions.

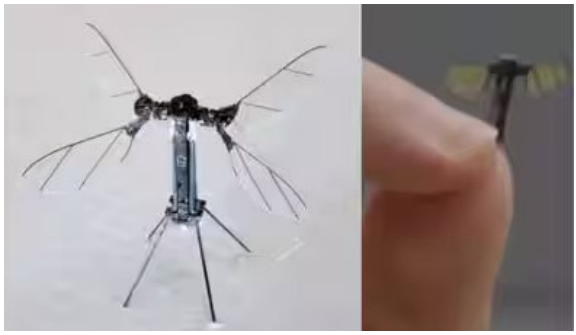
Photo 9. Autonomous, armed robot wolves



Source: Risom, 2026.

However, as we noted, the scope of scientists' interests is very broad, and to illustrate this, we must also mention microrobots, a prime example of which is an insect-shaped drone. Researchers at the National University of Defense Technology in China have developed a miniature robot capable of flying like an insect and even landing on a human hand. Despite its microscopic design, it features advanced electronics, a power supply, sensors and systems for recording video and audio, and its miniature size allows for nearly silent flight. This makes it ideal for use in the most discreet operations, both military and intelligence-related (Tomanek, 2026).

Photo 10. Insect-like robot for reconnaissance missions



Source: "What is China's", 2025.

AI in Command and Control and Electronic Warfare Systems

The possibilities offered by artificial intelligence are leading Chinese strategic thinkers to increasingly believe that AI could transform the fundamental mechanisms that determine victory in future wars. The increased presence of smart weapons on the existing battlefield could make large-scale, remote-controlled, precision, miniaturized, unmanned attacks the primary method of assault. According to analysts at the Chinese Academy of Military Sciences, the way in which artificial intelligence can increase the speed, accuracy and efficiency of operations will surpass the firepower, mechanical power and capabilities of conventional formations, becoming the most important factor determining the outcome of war (Kania, 2019). One of the key areas of development in this field of AI, which also poses a major challenge, is data. From a practical standpoint, data – considered a "key strategic resource" – is an essential element for creating an intelligent battlefield, where dominance in the field of artificial intelligence will be the key to success. Due to a lack of combat experience in conducting or co-conducting real operations, access to such data is a problem for the Chinese Armed Forces. Every opportunity to create databases from all possible sources is being utilized, and how to use them is the subject of collaboration between scientists and practitioners from the civilian sector, including the head of company "Alibaba." The intention is to use AI as a digital staff for operational planning, target identification and selection, and recommendations for reinforcing a specific course of action or shifting its focus (Bhardwaj, 2024). In preparing for future operations, PLA officers extensively utilize the latest AI solutions during training and exercises, where electronic warfare (EW) is a key element.

In the Chinese military's vision, unmanned aerial vehicles powered by artificial intelligence will distinguish and categorize electromagnetic signals using machine learning. Operating over enemy territory, they will disrupt the operation of the enemy's electronic equipment, air defence systems and fire-control radars, thereby enhancing their own offensive capabilities. The focus on EW is driven by the US and

NATO militaries' heavy reliance on satellite communications, GPS navigation and broadband internet. To achieve their own objectives, the Chinese will seek to disrupt communication and decision-making capabilities to reduce the effectiveness of enemy forces on the battlefield, while simultaneously developing their own independent systems (Agarkar, 2025).

Ethical issues regarding the military use of artificial intelligence

Artificial intelligence, autonomous weapon systems capable of independently deciding on their use, and autonomous armed robots operating in formation with soldiers or independently – these represent not only the building of a military advantage but also a range of challenges, risks and threats. Those directly involved in the development of these systems are most aware of this, and just as Albert Einstein did not participate in the Manhattan Project, and the equally great scientist Stephen Hawking, along with a group of over a thousand other scientists, researchers and technologists, published a letter warning that "an arms race in the development of artificial intelligence is a bad idea" ("Słynni naukowcy", 2015). Since then, a series of similar protests and warnings has been published, and many scientists have stopped working on AI development – not only in the military sector — but there is no doubt that such actions will not halt the work. What matters is "recognizing" the problem and engaging in discussions at various forums, including the UN, and the most optimism comes from the dialogue between the two biggest players in this field, namely, the US and the PRC. The validity of regulating the rules for AI's involvement in the decision-making process regarding the use of autonomous defence systems is confirmed by research by Kenneth Payne of King's College London, which challenges the assumption that "cool", emotionless artificial intelligence will inherently be more prudent than leaders who are often driven by emotions. In practice, the AI models used in the experiment treat nuclear weapons instrumentally. In all 21 games of the experiment, at least one side signalled the use of nuclear weapons. For them, it is a tool for achieving goals, not a moral boundary (Martynelis, 2026).

Although China competes with the United States in the development of AI, the two countries share a belief in the need to ensure security and manage risks, and they demonstrate their willingness to discuss AI security through concrete actions even as their technological rivalry remains fierce. This is confirmed by decisions made at the highest levels: following a meeting in November 2023 between Presidents Joe Biden and Xi Jinping, a formal US-China dialogue on AI was launched, leading to a 2024 declaration that both countries would ensure that humans retain ultimate authority over decisions to launch nuclear weapons, thereby preventing the control of such critical artificial intelligence systems. This topic is scheduled to be continued during the meeting between Presidents Donald Trump and Xi Jinping planned for May 13–15,

2026 ("US, China weigh launch", 2026). In China itself, particularly within institutions involved in the development of AI-based systems and among scientists in many fields, deliberations are underway regarding the ethical and moral issues raised by the implementation of AI. To improve dialogue with its competitor (the US), a team of researchers from Tsinghua University has developed a glossary of terms covering key concepts, such as autonomy and machine learning, to alleviate misunderstandings in military and technological contexts ("Interim findings", 2024). Lee Kai-Fu, a leading expert on the issue who has worked on AI development in both countries, devotes significant attention to ethical issues surrounding the use of AI and the roles of the US and the PRC in this area. Despite many concerns, he remains optimistic about the validity of AI development efforts and states "I am guided every day by an unshakable belief in AI's ability to make humanity better" (Kai-Fu, 2019).

Summary

The modernization of the PLA using artificial intelligence and robotics signifies a fundamental qualitative shift in its military capabilities, which aligns with China's overall goals for the country's modernization and technological development. The application of AI and robotics in autonomous drones, unmanned vehicles, marine robots, cyber warfare, logistics and space operations indicates a desire to match the US or even achieve a technological advantage. As these technologies evolve, new military strategies and doctrines will likely emerge. Realistically speaking, addressing these challenges must be a priority for the PRC, and the integration of artificial intelligence and robotics should promote security and stability at the regional and global levels. The dynamic development of artificial intelligence and robotics is decisively transforming the combat capabilities of the People's Liberation Army of China, constituting a key element of China's military strategy. China possesses a formidable industrial advantage: it is responsible for approximately 95% of global humanoid robot supplies. Public procurement documents and military patents from 2025–2026 indicate that the People's Liberation Army of China is intensively adapting these technologies for military purposes, and examples of specific applications are presented in this study. China is developing the concept of drone swarms operating in the air, on the water and beneath its surface, coordinated by artificial intelligence algorithms that enable mass drone swarms to navigate autonomously and identify targets even under conditions of intense electronic interference. In the event of a potential conflict over Taiwan, the People's Liberation Army of China plans to use swarms of unmanned systems to saturate and neutralize the adversary's air defences, as well as combat robots, thereby undermining Taiwan's defence assumptions, which are based on inflicting massive casualties on the attackers' personnel. Artificial intelligence drastically shortens the decision-making loop, and its systems analyze vast quantities of

data from radars, satellites, and sensors distributed across the battlefield within seconds, automatically detecting anomalies and targets, suggesting optimal tactical options to commanders, predicting the adversary's movements, and coordinating logistics in real time. China's rapid advances in this field are forcing other countries in the region to respond immediately. The Americans are leading the way; the Pentagon is implementing programmes aimed at offsetting China's numerical advantage (e.g. the *Replicator* initiative focused on mass drone swarms and tests conducted under the *xTechHumanoid program*), while their allies – Japan and Australia – are rapidly increasing defence budgets for autonomous systems and AI, closely integrating their detection systems within anti-China alliances. The development of artificial intelligence and robotics in the People's Liberation Army is drastically destabilizing the regional balance of power in the Indo-Pacific, accelerating the transition from information warfare to so-called intelligentized warfare. The greatest threat is becoming the shortening of the decision loop. When AI systems on both sides are deciding how to respond to threats within fractions of a second, the risk that a maritime or air incident will escalate into a full-scale conflict increases dramatically. Despite declarations about the need to maintain "human control" over weapons, time pressure in modern conflict is forcing machines to become increasingly autonomous. All of this confirms that the concerns regarding strategic stability, ethical challenges and the reliability of artificial intelligence expressed by the leading minds in this field remain highly significant in this context.

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Artificial Intelligence and Robotics in the Chinese People's Liberation Army (PLA)

Abstract

In response to the challenges posed by the US Army's "Revolution in Military Affairs" (RMA), the Chinese People's Liberation Army (PLA) has taken steps aimed at achieving a comparable level of combat capabilities by its 100th anniversary (2027). The approach of Chinese policymakers to the use of new technologies in the context of a future "intelligent war" is

highly likely to differ from similar American initiatives, due to differences in strategic culture, organizational characteristics and operational requirements. Observing the actions of potential adversaries and real-world operations in contemporary conflicts is bound to influence decisions regarding which capabilities may be advantageous, and through that shape the direction of Chinese military innovations. This study presents the direction of strategic thinking and concepts used in the implementation of the latest technologies by the PLA through an analysis of literature dedicated to military innovations in the context of China.

Keywords: Chinese People's Liberation Army, military innovation, new technologies, artificial intelligence, robotization

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Bogdan Tworkowski, Łukasz Szewczyk: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Visualization, Writing – original draft, Writing – review & editing.

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