Artificial Intelligence Potential Trends in Military

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***ABSTRACT**--Artificial intelligence (AI) is trending in the military and safety-critical application sectors. The private sector is currently helping the government sector implement advanced techniques to revolutionize different government and public sector management. It also helps to provide sustainable accountability in the accounting field; AI is bringing a revolution in concept building. It is bringing potential revolutions by using novel approaches in such directions. This paper is a new approach along the same lines; Our research focuses on AI in the military, the latest trend, and usages recently used for AI applications. This paper discusses the usage of AI applications in the military and the civil defense and health industry. We review and discuss the potential advantages of AI in military applications, HRMS, decision-making, disaster prevention and response, GIS and service personalization, interaction, big data analysis, pattern recognition and anomaly, intrusion detection, and discovery of new solutions using a highly configurable system and simulation in real-time.*

Keywords: Artificial intelligence, UAVs, HCS, Military technologies

I. INTRODUCTION

AI is depicted in the real world in films full of passion and fantasy[1]. When it comes to developing artificial intelligence in today's world, the task is becoming increasingly difficult to accomplish. In the military, space exploration, medicine, and other fields, artificial intelligence (AI) have already been developed or implemented. Viewers can confidently predict that an IA will be developed soon and that a complex machine will soon decide the fate of humanity in light of the cult films "The Matrix," "Terminator," and "I, Robot." What if I'm wrong about this? Do you think it's theoretically possible to create artificial intelligence, and how long do you think you'll have to wait?

Using the term "artificial intelligence" to describe what we are talking about is a bit misleading. Microchips are not built into most products today, except light bulbs, and manufacturers of virtually everything go to great lengths to convince us that their products contain artificial intelligence [2] (AI). Simply put, artificial intelligence (AI) copies the human behavior line on an artificially created object to achieve a variety of goals, such as lowering costs and saving time [3], which is the general thinking of mankind about its creation. As you assert [2,3], artificial intelligence will partially or completely replace humans in various fields (astronautics, work specialties, organically inspired communication, and so forth). Apart from that, artificial intelligence (AI) will assist a person in performing tasks that they are incapable of performing themselves (complex analysis and calculations) and increasing their overall intelligence. Starting with the fundamentals [4] will help us see the big picture.

A. Artificial Intelligence

Intelligence (intelligence) is derived from the Latin concept of intellectus, which means "mind, reason, and understanding.". Intellect and thinking are linked by many tasks and goals: recognition, logical analysis, behavior planning, synthesis of new concepts, and knowledge. Characteristics of the intellect When it comes to problem-solving, the ability to learn, generalize, accumulate experience, and adapt to changing conditions are all important. [3,5]. Solving problems entails the ability to learn from experience, generalize what has been learned, accumulate knowledge, and adapt to changing circumstances [3,5] Proceeding from the very definition of AI, the main problem in creating intelligence arises from the possibility or impossibility of modeling a person's thinking or at least a child. If this question is answered negatively, then the idea of AI itself loses its meaning in the root [6].

Generally, AI is a research area that creates models and appropriate software tools that allow computers to solve creative, non-computational problems that, in the process of solving, require recourse to semantics (a problem of the meaning). Research in the field of artificial intelligence includes formal problems (mathematics, games); universally significant tasks (natural language perception, situational behavior, reasoning based on common sense); expert tasks (scientific analysis, financial analysis, medical diagnostics, etc.) [7]. The first researcher of artificial intelligence is considered to be Alan Turing (born mathematician).

II. Literature Review

The very first intellectual tasks in which AI began to be used (more precisely, some kind of its similarity) were logical games (checkers, chess) and arithmetic operations (solving equations, proving theorems), as well as some simple toys [3,6]. An example of the latter was an electronic mouse, capable of exploring a maze and finding a way out of it (based on the simplest relay circuit). The first serious research on the creation of AI was undertaken almost immediately after the appearance of the first computers. In 1954, the Americans A. Newell, J. Shaw, G. Simon, and the Dutchman A. De Groot jointly created the first IPL1 symbolic programming language in the history of mankind and 1957 wrote a program for playing chess on it [8]. In 1960, the same group wrote the GPS program (General Problem Slover) - the universal task solver. The program was able to cope with several puzzles, the solution of integrals, and some other tasks. In 1962, cybernetics A. Samuel created a program for playing checkers [9]. She was so successful that she was able to win against the strongest USA drafts player R. Neely. In the late 60s, The first game programs appeared in systems for elementary text analysis and problem-solving in mathematics [8, 9]. Even then, the main problem with artificial intelligence became apparent: a program that can play chess will never be able to play checkers or dominoes. One more thing became clear to the programmers: all of the written programs lacked the most important element of all: knowledge in the relevant fields. The researchers sought to resolve these issues in the next decade. In 1974 an international electronic chess tournament took place. Machines become proud! The Soviet machine won it with the Kaissa chess program. Later, a program with a similar AI defeated world grandmaster G. Kasparov. The computer's configuration was 256 processors with 4 GB of disk memory and 128 MB of RAM each [10].

By the mid-1970s, the first intellectual programs using various knowledge representation methods for solving problems appeared - expert systems. One of the first was the expert system DENDRAL, designed to compile formulas of chemical compounds based on spectral analysis [11]. According to the perceptron model, developed by the American F. Rosenblatt in 1957, visual perception and recognition are controlled by the brain's visual cortex. In addition to learning, Perceptron was capable of working in two modes: recognition and recognition learning. The person presented the objects in the training mode and explained which class each belongs to (object description) [11,12]. Then, in the process of recognizing the machine, new objects were presented, and the machine had to classify them correctly of great interest from AI presented the program of mathematics Hao Wang, which worked on an IBM-704 for 3 minutes and 8.5 minutes to derive 220 relatively simple lemmas and theorems from a fundamental mathematical monograph, and then in 8.5 minutes worked on another IBM-704. Gave proof of another 130 more complex theorems, some of which had not yet been derived by mathematicians [13]. Later, other expert AI systems were created: MYCIN (intended for the diagnosis and treatment of infectious blood diseases), PROSPECTOR (predicts mineral deposits), SIMER (water quality assessment system), CASENET (diagnosis and treatment of glaucoma), etc. [14]. Today, the development of AI systems continues at an even faster pace. The world's largest institutions are working on this problem. Research laboratories of molecular biologists all over the world use the fruits of complex AI development automatic PCR techniques (polymerase chain reaction for DNA research), ELISA (enzyme immunoassay for protein analysis), and automakers development of AI for diagnostics and fine-tuning of engines and other parts of cars [15]. In short, the story of creating artificial intelligence continues.

A. Robotics and Autonomous Weapons

The capabilities of autonomous systems are still limited. Even though “shot-and-forget” systems have been created for decades, the people should still always be “in the loop” and directly make decisions on the use of weapons. This also applies to heavy aircraft, where, despite the autopilot, sensors, automatic opening of bomb-holes, guidance, and target tracking systems, pilots are still present, and the work of the drone UAV is monitored by operators [16]. But an ordinary person, compared to the capabilities of modern military equipment, is a weak, fragile and stupid creature, and in the chain of combat, decision making is also the slowest link. Artificial intelligence is designed to eliminate a person from the decision-making system, and at the same time to save the lives of servicemen. The possibilities of using tactical weapons with artificial intelligence are numerous. According to industry experts, considering the advantage that those who make decisions faster and hit first have in combat situations, fully autonomous systems will see significant advancement shortly. Unmanned aerial vehicles, armored vehicles, and rocket boats are examples of autonomous vehicles that can independently locate targets and decide whether or not to destroy them [4,16]. Furthermore, the concept of "contra-autonomy" has already emerged, which states that artificial intelligence that has been attacked but not destroyed will quickly learn and draw conclusions, after which it will deal a fatal blow to the adversary.

There is a rapid reduction in the cost of UAVs and drones, and their production is becoming widespread. Until recently, the cost of the fifth-generation fighter F-35 company Lockheed Martin was $100 million. A high-quality quadcopter costs $1000. This means that the US military can order hundreds of thousands of small UAVs for the price of one fighter [17]. Drones will be coordinated into a massive controlled "swarm" capable of launching a massive attack with the help of artificial intelligence (AI). The enemy will find it nearly impossible to deal with the massive number of drones loaded with explosives that will be launched

simultaneously. The Soviet Union and the Russian Federation have already put into practice the concept of combining several missiles from a single volley to form a "wolf pack" capable of exchanging information about targets among themselves, formulating a strategy for their actions, and independently selecting targets for an attack. These are the anti-ship missile systems P-500 Basalt, P-700 Granit, and P-1000 Vulkan. Our technology has great promise [18]. The US Navy creates a system that unites unmanned patrol boats in the "pack." This is the so-called CARACaS technology (Control Architecture for Robotic Agent Command and Sensing) or the "Management Architecture of a Team of Robotic Agents and Recognition," plus a system based on an independent platform that is being developed by the Naval Research Authority and can be installed on various types of small ships. By turning them into autonomous unmanned vehicles [19].

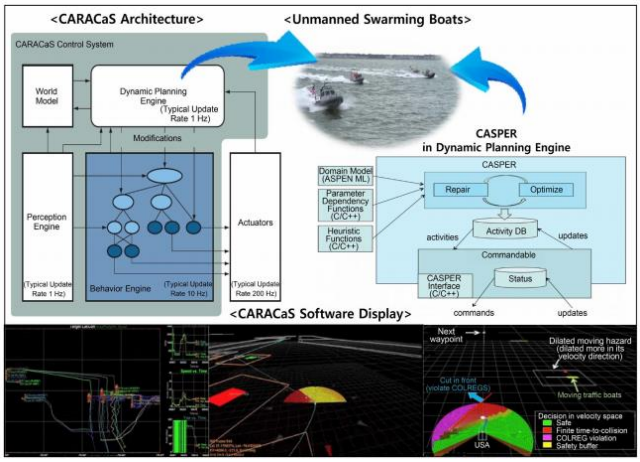

Fig. 1. CARACaS system software

The CARACaS system software is based on NASA technology created for rovers. A soldier using a portable device with CARACaS will be able to quickly and easily turn aircraft, armored vehicles, and boats into a single automated combat pack. Even more promising for artificial intelligence in space. You can create autonomous groups of tracking satellites or fighter satellites that do not require constant monitoring and special commands from control centers on Earth [17,19]. In the future, with the help of artificial intelligence, we can significantly improve the effectiveness of special forces and amphibious units. Even a small size group, using unmanned platforms, will be able to control large areas of the enemy's territory similarly and attack various targets with the help of autonomous interacting combat vehicles or prevent enemy units from entering a certain territory, thus holding the bridgehead. They can also fire at the enemy, deliver ammunition to special forces, and prepare bridgeheads for landing forces. Perhaps a tank with artificial intelligence would shoot its parachutists. Surprisingly, this can be avoided by equipping the machine with a "library of targets," as well as a facial recognition system. Taking into account that modern warfare strategies imply a change in the way troops are deployed. Modern warfare will be fought simultaneously throughout the enemy's territory: on the ground, in the air, in near-Earth space, and the information field and cyberspace are autonomous robotic fighter support systems will be developed very shortly. It will also accelerate the transition from manned combat missions to unmanned. As priorities of the near future, the Pakistan army should pay attention to autonomous weapons technology with network support, systems for human and machine interaction, including when making decisions, autonomous learning systems with artificial intelligence functions, to advanced unmanned systems. As for the robots themselves, it is hardly worth waiting for humanoid droids in the foreseeable future; most likely, they will look like rovers or turn out to be similar to the Astro droid R2-D2 from Star Wars [20]. A small autonomous robot can become an ideal sniper and wait for your goal in a position as long as necessary. Some types of flying or crawling robots will be able to penetrate the premises, inject a lethal dose of poison to the victim, or spray nerve gas and remain unnoticed. And again, a logical question: If hackers break into a combat vehicle with AI to disable it or even direct it against soldiers or civilians, what happens? Unlike machine intelligence or even supercomputers, artificial intelligence generates behavior algorithms for itself, and instead of permanent memory on discs or RAM of ordinary computers, it instantly arises and disintegrates chains of neural connections.

B. Use of AI in the Military-Industrial Complex

Artificial intelligence (AI) is used in warfare. The artificial intelligence market is expected to grow at a compound annual growth rate (CAGR) of 36.62 percent, from USD 21.46 billion in 2018 to USD 190.61 billion in 2025. Globally, related services, software, and equipment sales totaled $6.26 billion. The market for artificial military intelligence is expected to triple between 2017 and 2025, according to MarketsandMarkets [21].

Assistive technologies and cloud computing are driving increased sales of military AI solutions. Software, services, and devices used in-ground projects are the largest market segment for AI products for the army. An unmanned vehicle with artificial intelligence aids in various operations, particularly explosives disposal [18,21]. Analysts point to the need for advanced technological AI systems, participation in asymmetric military operations, and various US military modernization programs for the country's first place. 116 experts banned unmanned weapons from 26 countries in an open letter to the UN in August 2017. Notable signatories include Elon Musk, Tesla CEO, and Mustafa Suleiman, co-founder of Google-owned DeepMind Technologies. "Deadly autonomous weapons maybe the military's third revolution." A war on a scale never seen before and at speed never imagined. Terrorists and oppressive rulers will use this weapon to terrorize innocent

people, and it can be tracked and used in the most undesirable ways," the letter claims. "We don't have time. Close this Pandora's box once it's open," experts say.

C. Artificial Intelligence in Military

AI in military affairs is characterized by a lack of ability to distinguish the most important, low morale and volitional qualities (lack of systemic will and internal incentives), unprincipledness (no goal setting), illiteracy (there are no algorithms for working in an unfamiliar environment and a drastically changing situation), primitiveness (no experience of combat actions and the possibility of self-education), indecision (no criteria for making atypical military decisions), low persistence (the degradation of functions goes faster than the degradation of funds and carriers) and stupidity (inability to set tasks, military art rests). There are no military programs capable of at least to some extent corresponding to a real person to conduct a rational thinking and communication process, and it is not foreseen shortly (there are too many obstacles and unsolvable problems). Today, the computer performs only the exact instructions that it will give people. Since the computer itself is incapable of thinking in principle, but high-level programs for solving individual problems are relatively "intelligent," we can and only need to speak about tools for solving military-applied tasks and not flatter ourselves with the sonorous name of AI [22].

Fig. 2. Artificial intelligence in military

Unfortunately, no matter how sophisticated the device is in a modern program, no matter how complex algorithms are incorporated into it, in the end, it will not be able to do anything other than what is provided by its author. Perhaps in the future, something will change, but not today Scientists are trying to lift the veil of a distant future. Is it possible to create artificial intelligence? Is it possible to create such human-like systems that can think in abstract images, teach themselves, respond correctly to changes in the environment, have feelings, will, desires? Is it possible to create appropriate algorithms? Can humanity control such objects? Unfortunately, there are no answers to these questions because the person has not yet decided what AI is and its place and role. Military application artificial intelligence technology has broad application prospects in the military, and hundreds of successful application projects have appeared in this field.

Fig. 3. Military Robots

Given the level of development of robotics and artificial intelligence, it would be naive to assume that the security agencies of different countries bypass this area with their attention. Fig 3 shows that Military robots are created in the USA, Russia, Japan, China, South Korea, Israel, and other countries. Of course, like other military equipment, the exploited and promising robots seem to the general public quite metered - some projects are made public, others are kept secret [23]. Such devices can play a variety of roles: scouts, infantry, sappers, etc. To many, military robots in the army seem to be super movers, alone capable of putting whole units, or, on the contrary, as some cannon fodder, to which you can shift the most dangerous work on the front line. At the same time, the reality does not meet these expectations and scenes from science fiction films. In what direction does modern military robotics develop? Fig 4, China is very reluctant to demonstrate its military developments in robotics. However, it is reliably known that they are being conducted - and quite actively.

Fig. 4. Robotics development in China

D. Military Robots: Features of Development

Anyway, robots in armies have been used for quite some time. For example, in the Russian armed forces, military robots are counted from the late 30s - early 40s of the last century, when the Teletank (remote-controlled tanks) were used in the Finnish war. The history of robot sappers has been around for more than 40 years, and now a few people can be surprised by reconnaissance (Fig 6) or combat UAVs (Fig 5). Of course, the latest military robots are superior in their capabilities to other generations of such devices, but there is an interesting trend [22,23].

Fig. 5. Combat UAVs

At this time, most of the most advanced robots are not being developed to completely replace soldiers on the front lines of battle. Reconnaissance, work in the rear, and technical assistance in the conduct of hostilities are the primary functions of such vehicles. The reason is quite simple: while the works are not perfectly finished, they are still vulnerable, and their repair in the field is difficult, if not impossible, due to the conditions. As a result, law enforcement agencies do not want to dispatch vehicles to locations that are likely to be quickly disabled.

Fig. 6. Reconnaissance UAVs

Directly combat military robots are also being created, but many of them are either more primitive from a technological point of view or so far appear, rather, as potential designs and promising projects. At the present stage of the development of military robotics, most of the machines need to be controlled by an operator. If domestic and industrial devices can act independently, even new military robots lack such capabilities or are very limited. As a rule, the operator is away from the controlled robot, although there are projects where he sits inside. For example, one of the most famous Japanese combat robots, Kuratas (2012), has a cockpit in its upper body. However, the device can be controlled remotely [24].

E. Self-propelled Universal Systems

The first self-propelled system can be considered the teletank mentioned above or the more famous German “Goliaths” used in World War II. This is a good example, perhaps not of the most advanced but quite efficient and effective technologies created directly for military operations. Nowadays, self-propelled systems have become one of the most developed areas of military robotics. Such robots are equipped with various weapons (from machine guns to mortars), video cameras, night vision devices, manipulators, etc. Depending on the equipment, the purpose of the vehicle changes: it can serve as a scout, a sapper, or perform other combat missions.

Fig. 7. Self-propelled universal systems

It can patrol territory or transport cargo, mine or clear mines, shoot or interfere with shooting (due to a smokescreen). From the outside, it seems that the use of the robot is limited, rather, to the owners' imagination. In particular, propaganda management was mentioned among the examples of use: a loudspeaker is mounted on the robot, after which the device is launched along the required route.

Among similar complexes, we note “Argo” (2013), which can swim, or “Nerekhta” (2015), which is considered one of the most promising developments. More than 10 modules have been developed for it, including anti-tank and medical. "Uranium-6" is a robot-sapper, which is used for mine clearance. It can withstand the explosion of a 60-kilogram charge of TNT, and thanks to an intelligent e-filling, it can detect and neutralize various types of shells, bombs,

etc. Uran-9 is a multifunctional complex, which can withstand infantry, tanks, helicopters, and fight in urban conditions. Depending on the modification, this machine can carry a machine gun, a flamethrower, anti-tank missiles, a smoke screen system, etc. The heaviest family member - “Uranium-14” - is designed to extinguish fires (it has a water tank and a foam tank, a pump, etc.). The military also uses it to dismantle barricades, blockages, etc. [25].

F. Intelligence Robots

Drones with a good camera and a long range are now available to almost everyone. And began the development of these devices in the depths of the military departments. At the moment, these machines are used by defense departments of 70 countries. Of course, military UAVs are more advanced than civil ones, plus new projects appear regularly, although the very principle of their work does not change much at the same time. Therefore, we suggest contacting other types of robots.

An interesting development looks like a robot snake (Israel, 2009), as shown in fig 8. The robot is equipped with a thermal imager, camera, microphone. It can crawl quietly in the countryside, even with very difficult terrain. Invisible, nosy, and very attentive - in short, an excellent intelligence officer. A few years later, the United States also had its own “snake” - it knows how to climb trees, twist objects around and thus shoot from more than secluded places [24,25].

Fig. 8. Robo Snake (Israel 2009)

Another Israeli development is the miniature Dogo. He has a good cross, including the ability to climb stairs. However, it would be wrong to call him only a scout since such robots can be equipped with stun grenades, a blinding laser, or a Glock-26 pistol. An important advantage of Dogo is that he can fight even in the conditions of the city (and, accordingly, of the constrained space).

The scouts embraced not only air and land but the water sphere. In 2017, the United States announced an Orca unmanned aircraft, which will operate underwater. It is expected that the Orca will have two major differences from other similar machines. The first is size. Dimensions novelty will correspond to a full-fledged submarine, while other complexes are quite compact. The second is maximum autonomy. It will be enough for the operator to give Orca a command (not only for reconnaissance, but also, for example, for cargo delivery), and the submarine (as shown in fig 9) will execute it and return to the base itself [26].

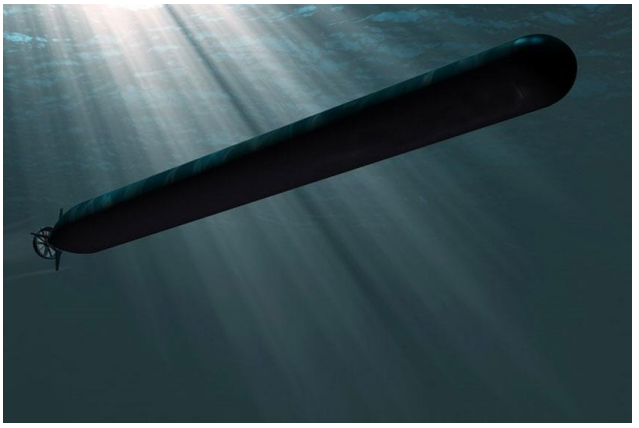

Fig. 9. Self-operated submarine

G. Mine Clearance

In a separate group, select the robot engineers (fig 10). The military has used them for quite a long time, and in many films, you can see how an operator works from a relatively safe distance with an explosive device carefully, and his machine is his hands. Such robots, of course, are used to this day. The basic principle of their work has not changed, although they have become more perfect. For example, the Russian Bogomol-3, created back in 2004, climbs the steps 20 cm high and works with charges attached to the bottom of the car. The minimum required "Mantis 3" clearance is 10 cm [23,26].

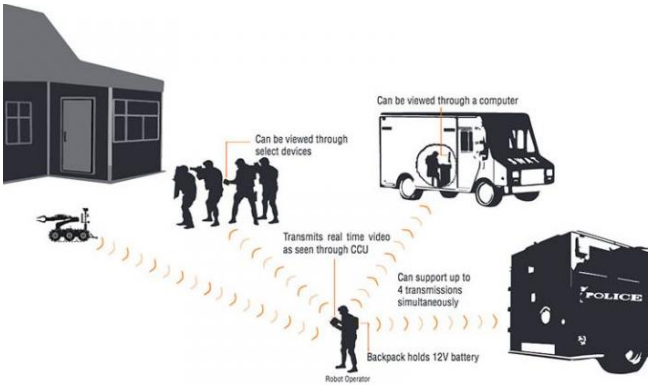

Fig. 10. Robot engineers

Fig 11 shows an interesting robot sapper that was introduced in the USA in February 2017. It is designed to work

underwater and can demine any water bodies - from boats to bridges. This system, called the Underwater Dual Manipulator, really has two hands, and their design and materials are used to ensure proper maneuverability, accuracy, and accuracy of movements. The robot should be mounted on unmanned swimming vehicles to make the complex completely autonomous [25,26].

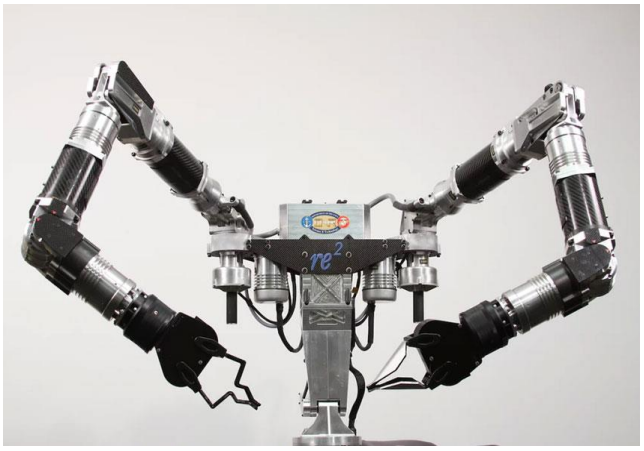

Fig. 11. Robot sapper

III. THE MAIN APPLICATIONS AVAILABLE FOR MILITARY

A. Autonomous Multi-Role Combat Robot System.

Among its primary capabilities are the ability to identify terrain and features and choose the best course of action, to determine the enemy's situation, to penetrate deeply into the enemy's position, and to independently complete reconnaissance tasks such as transporting ammunition and minesweeping, shooting and bombing, and transporting injured personnel.

B. Military Aircraft "co-pilot" System.

A few of its most notable characteristics are the ability to identify terrain and features and choose the best course of action, to determine the enemy's situation, to penetrate deeply into the enemy's position, and to independently complete reconnaissance tasks such as transporting ammunition, minesweeping, shooting and bombing, and transporting wounded personnel.

C. Independent Multi-Purpose Military Spacecraft Control System.

It can autonomously adjust and maintain the normal attitude of the military spacecraft's flight attitude during operations. At the same time, satellite faults can be detected and eliminated automatically using advanced algorithms. A real-time command to return to the base or destroy the satellite is issued when the satellite is in an emergency.

D. Automatic Fault Diagnosis and Elimination System for Weapon Equipment

A computer system with an artificial intelligence expert system as the main program and a robot system for executing commands are installed in the weapon equipment. The expert system is equipped with a software package that automatically diagnoses various faults and reflects expert knowledge. After the expert system determines the fault, an instruction is issued to the robot maintenance system to eliminate the fault (or potential fault) in time.

E. Military Artificial Intelligence Machine Translation System.

It can collect intelligence, decipher passwords, handle combat texts, coordinate operational command, and provide tactical decision-making. A system is a smart machine for language analysis, synthesis, recognition, and natural language understanding, storing basic vocabulary and grammar rules in multiple languages.

F. Ship Combat Management System.

It can be used for local sea operations command, assisted tactical decision-making, maritime target enemy and enemy identification, shore-to-ship integrated operations management, etc.

G. Intelligent Electronic Warfare System.

It automatically analyzes and masters the search, interception, and tracking sequence of enemy radars, issues warning signals about enemy missile launches, and determines the best defense and interference measures.

H. Automatic Intelligence and Image Recognition System.

It uses intelligence analysis and image processing technology to identify, classify and process enemy intelligence and images. At the same time, automatic decision-making opinions are provided.

I. Artificial Intelligence Weapons.

Artificial intelligence technology is rapidly developing. Its control system can identify, judge, and make decisions. The application of intelligent machines, intelligent weapon equipment, And the development of artificial intelligence and intelligent robots will significantly impact military equipment development and the strategy and tactics of future wars. Such as: after the launch, "do not care" automatic guided intelligent missiles, intelligent mines, intelligent torpedoes and mines, underwater military operating systems.

J. Artificial Intelligence Robotics Border Surveillance

Recently Israel using robots for border security. These robots are armed with firearms and equipped with the latest technology thermal cameras and high-resolution cameras. These robots not only detecting the live being but also identified the object. It can recognize that the coming object is a Human or a Car. It also identified the human or a cat or dog. It also detects the human is armed or just a visitor. It will warn the human before hitting him. Powerful infrared cameras make them enable to see the object at night or in the darkness. This was a good project in no men's land or border security.

Fig 12. Robotics Border Surveillance

K. Robot Army

Many countries, including Israel and India, spent most of their assets in the robot army. They form an army that will intelligently hit the target, make strategy according to the ground condition, and make its way by itself.


Fig 13. Robot Army

IV. CHALLENGES

There are several unresolved challenges to be addressed before developing and deploying an artificial intelligence application for military purposes. The most pressing issues facing artificial military intelligence are Transparency, vulnerabilities, and learning are all important factors to consider, even with limited training data. This paper does not cover other important but less critical challenges related to optimization and generalization, such as architectural design, hyper-parameter tuning, or production-grade deployment.

V. ETHICS ISSUES

Machines do not experience moral torment, fear, doubts about the correctness of their actions. In a way, this makes them more executive soldiers than people, and at the same time, more dangerous. That is why many famous people and organizations oppose giving robots the ability to use lethal weapons independently (without orders from humans). For example, Elon Musk and another 115 experts in 2017 appealed to the UN to ban such developments. Corresponding communities also appear, such as the Campaign to Stop Killer Robots organization, created in 2012 [27].

VI. DISCUSSION

It's impossible to prevent artificial intelligence from being used in warfare. Social technologies like talent management, which involves military personnel in the innovation process and develops officers' creative potential, have become critical in armaments. Informational, tactical, strategic, and economic tasks are the four responsibilities. Artificial intelligence will vastly increase the number of data collection and analysis options available, as well as the speed and quality of data processing. There will be more opportunities and sources of information in military intelligence and more opportunities to keep the truth hidden from the enemy. Artificial intelligence can add a large amount of artificially created data to the information space, creating a virtual truth that confuses potential adversaries and introduces political risks. Machine learning and artificial intelligence technologies have the potential to ensure national security. Artificial intelligence can also be used to defeat enemy radars by analyzing enemy radar operations and selecting suppressors. Many highly qualified experts are needed to keep track of constantly evolving cyber threats. Artificial intelligence could also aid in the detection of flaws as well as the development of code and machine algorithms. Man-made defenses will be swept up in the hunt for "weaknesses." Cyber-attacks will become more sophisticated and dangerous, posing a greater risk of intruders or competitors gaining access to sensitive information.

Artificial intelligence will be tasked with strategic tasks in which people will play unique roles. The emergence of autonomous tactical weapons and colossal computing power in the future for "intellectual" intelligence, analysis of India's actions and troops, and finding optimal solutions means that strategies and methods of deploying and controlling troops will change, according to the General Staff of the Pakistan

Armed Forces. Artificial intelligence in conventional weapons will become a factor in strategic deterrence and nuclear weapons, accelerating the innovation race. In the twenty-first century, power rivalries persist, and terrorist organizations have amassed entire armies, so military equipment must evolve and improve regularly. If one state uses artificial intelligence technology to take control of all its rivals' major systems, the conditional "Third World War" could happen in a matter of seconds. Not only the military but also the government should be represented in this way. The value of innovative changes must be understood by policymakers at the state level since there is an opportunity to wage a new type of war and provoke a real conflict between different countries. Artificial intelligence can also be included in the technology of public administration, strengthening power, and becoming a domestic policy instrument. It will also assist government agencies in managing catastrophic risks and preventing man-made disasters. Progress in the creation of artificial intelligence will have a powerful impact on the economy and may lead to a new industrial revolution. The power will be the first to introduce it and gain economic, informational, and possibly military-political superiority over India. The development of artificial intelligence has become a strategic task for superpowers in the 21st century. At the same time, it is extremely important to answer the question: whom will we grow as our assistants - the cynical and inhuman artificial "Mephistopheles" or the electronic Guardian Angel? Suppose Pakistan can create breakthrough technologies, concentrating on the main efforts and resources. In that case, this will ensure the preservation of strategic parity with India, the United States, and China, as well as Russia on a new stage in the development of military technology, especially during a difficult period when the world hegemon realizes that it is losing its power and transforming into one of the great powers, which means that instability emerges in the world, rife with conflicts, including those involving India, the United States, and China. To maintain its hegemony, the US will continue to incite conflicts and, sooner or later, will wage a real war against aspirants to hegemony who will follow the twenty-first century's new rules.

Given that our financial and technical capabilities to develop a new generation of missiles, anti-ballistic missiles, attack complexes, and means of protection are now lower than those of potential enemies because of our economic weakness and long-term degradation of Pakistan science and education, artificial intelligence will become our ally in addition to the two (army and navy). He will analyze the actions of our opponents, collect scientific information, and find the best ways to solve complex engineering problems that we could not solve earlier due to the lack of information, data, or scientific knowledge in interdisciplinary areas. He will also assist in making strategic decisions because any strategic and defense task is a tremendous number of man-hours, analysis, and modeling.

Artificial intelligence is a strategic project of the future, and the race to create it will be comparable to the nuclear race of the mid-twentieth century, but for now, only certain tasks have been solved on data analysis and pattern recognition, text translation. It is important to understand that artificial intelligence is not a supercomputer; it works on completely different principles. But the arguments about the technical singularity and the uprising of machines - this is still unscientific fantasy. The main task is not solved - creating the same computer comparable in power and capabilities with the human brain. Currently, the leader in the production of military robots in the world is the United States. This trend in the country has been particularly active since the days of the Cold War. However, this statement is true for Russia, which also introduces robot technologies in the armed forces. In 2014, a comprehensive targeted program, “Creating promising military robotics until 2025,” was approved. The concept of the use of military robotic systems for the period up to 2030 was also created.

VII. Conclusion

Within a relatively short period, the new global technology race will introduce cutting-edge military technology. Because any rival that falls behind increases the vulnerability, which will be extremely difficult to cover with conventional weapons, all the world's leading powers will deal with it. Also, the emergence of new technologies can lead to noticeable changes in the armed forces' strategies, planning, and organization. Therefore, to preserve sovereignty and defense capability, Pakistan should strive to obtain certain advantages or at least parity with likely adversaries in several critical directions as soon as possible to partially compensate for the current weakness of the Pakistan economy and the technological gap between industrial sectors.

References

[1]. Artificial Intelligence Comes of Age—Slowly. (2018). *The AI Advantage*. doi:10.7551/mistress/11781.003.0003.

[2]. Artificial Intelligence for the Internet of Everything. (2019). doi:10.1016/c2018-0-00012-2.

[3]. A. Ali, Y. Hafeez, S. Muzammil Hussainn and M. U. Nazir, "BIO-INSPIRED COMMUNICATION: A Review on Solution of Complex Problems for Highly Configurable Systems," 2020 3rd International Conference on Computing, Mathematics and Engineering Technologies (iCoMET), Sukkur, Pakistan, 2020, pp. 1-6.

[4]. Norris, D. J. (2017). Basic AI Concepts. Beginning Artificial Intelligence with the Raspberry Pi, 17-48. doi:10.1007/978-1-4842-2743-5_2.

[5]. Hallevy, G. J. (2014). External Element Involving Artificial Intelligence Systems. *Liability for Crimes*

Involving Artificial Intelligence Systems, 47-66. doi:10.1007/978-3-319-10124-8_3.

[6]. Kahane, A. J. (n.d.). The Problem with Tough Problems. *Creating Desired Futures*. doi:10.1515/9783034611398.141.

[7]. Lansky, A., & Philpot, A. (n.d.). AI-based planning for data analysis tasks [for Earth sciences]. *Proceedings of 9th IEEE Conference on Artificial Intelligence for Applications*. doi:10.1109/caia.1993.366640.

[8]. Newell, A. J., Shaw, C., & Simon, H. (1988). Chess Playing Programs and the Problem of Complexity. *Computer Chess Compendium*, 29-42. doi:10.1007/978-1-4757-1968-0_4.

[9]. Ali, A., Jadoon, Y. K., Changazi, S. A., & Qasim, M. (2020, November). Military operations: Wireless sensor networks based applications to reinforce future battlefield command system. In 2020 IEEE 23rd International Multitopic Conference (INMIC) (pp. 1-6). IEEE.

[10]. Marks, H. (2013). The Most Important Thing Is … Combating Negative Influences. *The Most Important Thing Illuminated*, 97-110. doi:10.7312/columbia/9780231162845.003.0010.

[11]. Akbari, M., & Rashidi, H. (2016). A multi-objectives scheduling algorithm based on cuckoo optimization for task allocation problem at compile time in heterogeneous systems. *Expert Systems with Applications, 60*, 234-248. doi:10.1016/j.eswa.2016.05.014.

[12]. Kent, L. (2019). Duration Perception Versus Perception Duration: A Proposed Model for the Consciously Experienced Moment. doi:10.31234/osf.io/g2t5z.

[13]. Rossi, R. J. (2006). Theorems, Corollaries, Lemmas, and Methods of Proof. doi:10.1002/9781118031575.

[14]. Mao, Y. J., Su, L., Li, H., Yang, Y., & Weng, B. (2018). Desirable quality-control materials for the establishment of qualified external quality assessment on prenatal diagnosis of chromosomal aneuploidies. *Clinica Chimica Acta*, *487*, 80-83. doi:10.1016/j.cca.2018.09.016.

[15]. Hoy, M. A. (2019). DNA Amplification by the Polymerase Chain Reaction: Providing a Revolutionary Method for All Biologists. *Insect Molecular Genetics*, 263-314. doi:10.1016/b978-0-12-815230-0.00007-8.

[16]. Baomar, H. A., & Bentley, P. J. (2016). An Intelligent Autopilot System that learns piloting skills from human pilots by imitation. *2016 International Conference on Unmanned Aircraft Systems (ICUAS)*. doi:10.1109/icuas.2016.7502578.

[17]. Chapman, B. (2018). Emerging Military Aviation Trends and Potential US Aerospace Adversaries. *Global Defense Procurement and the F-35 Joint Strike Fighter*, 45-87. doi:10.1007/978-3-030-01367-7_3

[18]. Zeng, J. Y., Zhong, J. L., Xie, Y. P., & Fan, X. L. (2014). Research on Anti-Saturation Attack Model of Ship Formation for Anti-Ship Missile Targets. *Applied Mechanics and Materials*, *615*, 276-281. doi:10.4028/www.scientific.net/amm.615.276

[19]. Abielmona, R., Petriu, E., & Groza, V. (n.d.). Agent-based control for a dynamically reconfigurable mobile robotic structure. *International Workshop on Robot Sensing, 2004. ROSE 2004*. doi:10.1109/rose.2004.1317609.

[20]. Duran, B., & Thill, S. (2012). Rob's Robot: Current and Future Challenges for Humanoid Robots. *The Future of Humanoid Robots - Research and Applications*. doi:10.5772/27197.

[21]. Artificial Intelligence to Predict Intimate Partner Violence Perpetration. (2018). *Artificial Intelligence and Social Work*, 195-210. doi:10.1017/9781108669016.013.

[22]. Yoon, M., & Baek, J. (2016). Paideia Education for learners' Competencies in the Age of Artificial Intelligence - The Google DeepMind Challenge Match. *International Journal of Multimedia and Ubiquitous Engineering*, *11*(11), 309-318. doi:10.14257/ijmue.2016.11.11.27.

[23]. SZEGEDI, P., KORONVÁRY, P., & BÉKÉSI, B. (2017). THE USE OF ROBOTS IN MILITARY OPERATIONS. *SCIENTIFIC RESEARCH AND EDUCATION IN THE AIR FORCE*, *19*(1), 221-230. doi:10.19062/2247-3173.2017.19.1.2.

[24]. Funk, M., Irrgang, B., & Leuteritz, S. (2016). Drones @ Combat. *Drones and Responsibility*, 182-196. doi:10.4324/9781315578187-11.

[25]. Ali, A., Jadoon, Y. K., Dilawar, M. U., Qasim, M., Rehman, S. U., & Nazir, M. U. (2021, April). Robotics: Biological Hypercomputation and Bio-Inspired Swarms Intelligence. In 2021 1st International Conference on Artificial Intelligence and Data Analytics (CAIDA) (pp. 158-163). IEEE.

[26]. Bushey, D. E. (n.d.). Unmanned Aircraft Flights and Research at the United States Air Force Academy. *Unmanned Aircraft Systems*, 79-85. doi:10.1007/978-1-4020-9137-7_6.

[27]. Carpenter, C. E. (2016). Rethinking the Political / -Science- / Fiction Nexus: Global Policy Making and the Campaign to Stop Killer Robots. *Perspectives on Politics*, *14*(1), 53-69. doi:10.1017/s1537592715003229.