

AI TROOPS AT YOUR COMMAND

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ABSTRACT

Beholding the 3rd largest army and the place of the 7th largest country in the world, India has been emerging as the development icon in the world. The aim is clear and the path is ready to be painted with the colour of victory and pride. Development and transformation not only bring growth but also introduces new conflicts and competitions even in the arena of security. Just as iron wins over iron, new generation huddles can be bypassed by new generation solutions especially under the command of AI. The merits of AI are not only limited to voice remotes, filters and helpers but the effect has a shadow on the field of national security as well. Once the bar is set, it has to be raised periodically to achieve great heights and the following content will provide a glimpse of the same.

INTRODUCTION

Robotics is a branch of engineering that includes branches such as mechanical, electronic, information, and computer, among others. Robotics is concerned with the planning, construction, operation, and design of machines, among other things. Computer systems have been utilized to control and check sensory feedback and knowledge processing since technology has advanced and improved. Advanced robotics technologies and huge advancements cleared the stage for the development of human-like robots.

These robots can be utilized in risky conditions that humans are unable to handle or endure. They've been trained to be able to emulate humans in every aspect. Robots come in a variety of shapes and sizes. However, they are mostly created in human shape for our convenience. Another rationale for developing and employing robots is that, in comparison to people, they can operate constantly without assistance for an extended period of time.

Throughout history, different inventors, engineers, and technicians have predicted that the robotics sector will have enormous potential in the near future. Unmanned armed war platforms are now in use in the military industry. Unmanned armed vehicles are preferred in difficult missions because they are safe and trustworthy. By focusing on this problem, several countries want to increase their defence and military capabilities. An unmanned vehicle with well-developed software and hardware will be able to perform well in the field. Future applications of unmanned vehicles will be studied. An operator is usually in charge of armed unmanned vehicles. Users manually aim with the remote control to locate and target a prospective attacker. If there is a task to be completed, it is completed using human decisions and commands. When these systems, which have a massive weapon platform mounted above them, fire, there is a lot of noise, light, and vibration. Because people determine potential targets in the field, the effectiveness of these human-based systems is dependent on the users who employ these tools.

The USP of this showcase lies in the description of the operation and modelling of an unmanned vehicle with weapons and detectors operated automatically, as an alternative to unmanned ground vehicles operated manually. This robot would not only work in field during wars but can also be used efficiently as an anti-terrorist and rescuing robot. This robot can be automated with the help of programming along with Arduino. In addition, in this study, autonomous target detection and object targeting methods, which can be a solution to human-controlled vehicles, are also explained. As a solution to the failures especially in long-range firing.

A vehicle with autonomous target detection and targeting system can detect targets and aim at the target without the need for human commands, this will be a solution to the negativities arising from human errors and deficiencies in today's armed vehicles. With these studies, it is aimed to bring new solutions for future armed unmanned vehicles.

PRESENT SCENARIO OF ROBOTICS & AI IN THE WORLD:

Human resources are an organization's most valuable resource, and human life is the most valuable form of life. Warfare has traditionally been known to be the most wasteful of human lives and other resources. 70-80 million people died in World War II, which was a tremendous loss for mankind as a whole. Robotics' introduction into modern combat is a double-edged sword, as it tries to protect an army's human resources while also completing aspects of a conflict that people may or may not be capable of.

Robots can do a variety of activities more safely and efficiently than humans, which could threaten the lives of soldiers in a battle. As a result, militaries are attempting to offload many of their tasks that would otherwise be onerous on humans to robots. After a certain number of hours, humans lose their effectiveness and require ongoing physical and psychological care.

As Karl Von Clausewitz noted in his analysis of Napoleon's Russian Campaign, his army died as a result of its own efforts, suggesting that Napoleon arrived in Moscow with a reduced army, fatigued men, and worn-out horses, and thus was unable to wage the war effectively there. Similarly, Hitler's Operation Barbarossa failed primarily due to the army's physical exhaustion and inability to live in the severe climate.

Unmanned technologies, such as robots, offer a significant advantage over manned forces in that they can operate in tough conditions and even in biologically and chemically contaminated situations. Robots can withstand harsh operational conditions, such as strong 'G' turns, which can render plane pilots ineffective. Unmanned devices have the ability to fly faster and turn harder than humans. This is true in all domains, whether they are air, land, or maritime.

China has made it obvious that it wants to govern the AI world in the next years, and it is well ahead of India in terms of military robotics capabilities. Not only China, but many major countries such as the United States, Russia, and others have made significant efforts in recent years to prioritize AI development and deployment for military objectives. Several roadmaps are being developed in order to achieve global dominance in this industry, which plainly implies military power.

India, on the other hand, is still lagging behind these countries in terms of AI capabilities and could be severely disadvantaged in the near future if significant progress is not achieved in these areas. Although the Government of India and the Ministry of Defence have expressed a keen interest

in this issue by enlisting several prestigious institutions such as IITs, DU, and other Technology and Science institutes to undertake programs for the development of AI for military purposes, as well as allocating more and more funds for digitalizing India, these efforts pale in comparison to those made by the countries mentioned above, particularly China. This power imbalance caused by AI could be a severe setback for India's military capabilities as well as its ability to secure its borders from foreign infiltration.

In view of recent tensions with China and Pakistan, India should prioritize the development of AI and robotics for military purposes, and recognize that the IT industry is underutilized and, if properly utilized, may be a boon to its military capabilities when it comes to AI.

PRESENT SCENARIO IN INDIA

I myself being a student of Artificial intelligence at Bennett University know that it is a key component of the Industrial Revolution and a significant technological achievement in the current period. Artificial intelligence has made a successful transition from the scientific to the commercial domains, and it is now firmly entrenched in the daily lives of ordinary people in the shape of gadgets, mobile phones, computers, and social media. Along with this, artificial intelligence has played a significant role in modern combat.

The use of artificial intelligence in the form of robots in armies is one of the most significant innovations in modern warfare. Artificial intelligence in warfare has been a sensitive topic because, while it has the potential to alter modern warfare, it also raises ethical and technical concerns. This article will attempt to illustrate the need for robots on the battlefield, as well as discuss the future of robotics in the Indian army and the benefits of robotics in military applications. At the end of this paper, I'll try to comment on a few proposals that could help improve India's position on these issues. India, on the other hand, being an IT center, has a significant advantage in this area.

"New and emerging technologies like AI and Robotics may perhaps be the most crucial determinants of defensive and offensive capabilities for any military force in the future," Prime Minister Narendra Modi said at DefExpo (Chennai) in 2018. India, as the world's leading IT country, will try to make use of this technological superiority. Organizations such as the Defence Research and Development Organisation (DRDO), the Centre for Artificial Intelligence and Robotics (CAIR), Hindustan Aeronautics Limited (HAL), and a number of other public and private institutions have been working to develop artificial intelligence for military purposes in response to these claims. One such endeavour is the Multi-Agent Robotics Framework (MARF), which is expected to transform the Indian military's battle capabilities. This effort intends to combine current robots, such as wheeled robots, with newly developed technology, such as snake robots and wall-climbing robots. All of these new robots have been built to work in a variety of challenging terrains and elevations. The demands on the battlefield are shifting as the nature of combat changes. Combating terrorism and performing counter-insurgency or counter-terrorist operations are two such challenges.

India has always had these problems due to its geological and political conditions. The Indian army and the Ministry of Defence have been leaning toward using a large number of robotic surveillance systems to aid in the monitoring of terrorist operations as well as the successful transmission of intelligence reports. Robotics like these might be utilized in Jammu and Kashmir, as well as in incidents like the Pathankot attack. Aside from that, robots are being created for anti-terrorist operations to defuse bombs, toss grenades, and handle firearms. The 'Netra' UAV is being

designed for counter-terrorism surveillance and reconnaissance missions in both urban and jungle settings. Not only that but robots can also be employed to track and cure injured soldiers in a fight. The Indian army is also aided by the Niti Aayog's effort 'National Strategy for Artificial Intelligence,' which includes various artificial intelligence and robotics research initiatives.

The global security situation has altered dramatically in terms of lethality, making traditional military approaches obsolete, and the value of robots in militaries cannot be overlooked. Even though India possesses a technological advantage, it is underutilized in every way. Several projects have been started on paper, but their implementation remains shaky. In light of the world's growth, and particularly in light of China's tremendous progress in the field, India must regard AI as a crucial component of national security.

PRESENT STATUS OF DRDO

Nowadays we can clearly notice that how the superpower countries like the USA, China, France, Germany, etc are working with great pace in this field whereas on the contrary part in India, to be honest, this field not completely bloomed yet but we too are coping up at a good pace with the aid given by Indian government and DRDO. We can hope that in the upcoming 10 years the rate at which India is undergoing development though with some loopholes still, it's very much possible to see India at its epitome.

As mentioned above coming to the present scenario of what DRDO has made till now are:

1. REMOTELY OPERATED VEHICLE (ROV) DAKSH: The ROV is versatile equipment for improvised explosive device identification and handling.
2. UNMANNED AERIAL VEHICLE (UAV) 'NETRA': This mini UAV has been developed for surveillance applications.
3. Confined Space Remotely Operated Vehicle (CSROV): DAKSH MINI is capable of extracting suspected objects with a telescopic manipulator arm.
4. Surveillance Remotely Operated Vehicle (SROV) (on the verge of induction): The DAKSH-SCOUT is remotely controlled from a portable Operator Console using RF.
5. Unexploded Ordnance Handling Robot (UXOR): The UXO handling Robot (UXOR) is capable to handle, diffuse and detect Unexploded Ordnance (UXO) i.e. Bombs and Missiles up to 1000 kg remotely from 1km LOS.

For detailed info- <https://www.drdo.gov.in/robotics>

Though we have a decent amount of them still the destination is far ahead and we also need to develop some sort of robot that can also play the role of rescuing like VISHNU and should try saving the lives of NGS and other soldiers in rescuing the hostages under any attack situation.

VAYU- AN ELECTRO-BLOODED BATTLER

As we are focusing on the anti-terrorist and rescuing prospect of this robot in this blog so it is important to keep in mind that India still relies mainly on manpower and to be precise NGS for rescuing which many a time causes some number of casualties. In order to decrease that casualty bar to zero, the implementation of these robots is a necessity. The main focus is on terrorism and

security may have geared up following the 26/11 attacks in India, when 10 members of Lashkar-e-Taiba, an Islamist terrorist organization from Pakistan, carried out 12 coordinated shooting and bombing attacks lasting four days across Mumbai. A total of 175 people died, including nine attackers, and more than 300 were wounded. Many soldiers were struggling to save the people inside the Taj hotel in Mumbai whereas many people lost their lives from this an idea is stuck in our mind to design a robot that can tackle such worst situations.

A possible solution to fill such loop holes can be VAYU

From footsteps to paths that lead to kingdoms with mightiest still being the VAYU'S (Air) with no place untouched. This necessity has now been reshaped into a saviour who is a buddy in routine, a trustworthy soldier in a clash and a masiha in holocaust. Decorated with exceptional situation tackling abilities on an AI base, VAYU can prove to be an effective human replacement in a high-risk scenario, still leashed to a wise command.

It is a robot which can be used as a warfare robot but also as a rescuing anti-terrorist robot. The concern here is that it would be completely automated using programming and arduino which in a worse case can be hacked and can be misused, In order to stop the following we would be needing really skilful team to work on this and a massive support from DRDO and Indian Gov. The components that I thought of installing in VAYU are as follows:

1. IR Human Detector This Infrared Human Sensor reference design detects human presence/absence using an infrared sensor, and turns on/off a high brightness LED automatically, and can detect any sort of danger or movement ahead.

https://en.wikipedia.org/wiki/Thermographic_camera

2. Electromagnetic Gun are systems that launch bullets directly with electrical energy without using any flammable materials such as gunpowder. When the electromagnetic gun fires, it does not produce any sound, light, or vibration.

<https://en.wikipedia.org/wiki/Railgun#:~:text=A%20railgun%20is%20a%20line%20ar,kinetic%20energy%20to%20inflict%20damage>.

3. Metal Detector :A metal detector is an instrument that detects the presence of metal nearby. Metal detectors are useful for finding metal inclusions hidden within objects, or metal objects buried underground, for instance finding out mines.

https://en.wikipedia.org/wiki/Metal_detector

4. Fire Detector: Fire detectors sense one or more of the products or phenomena resulting from fire, such as smoke, heat, infrared and/or ultraviolet light radiation, or gas.

https://en.wikipedia.org/wiki/Fire_detection

5. Water Cannon - A water cannon is a device that shoots a high-velocity stream of water. Typically, a water cannon can deliver a large volume of water, often over dozens of meters.

https://en.wikipedia.org/wiki/Water_cannon

6. Telescopic Arm :Telescoping in mechanics describes the movement of one part sliding out from another, for extracting suspected objects with a telescopic manipulator arm.

[https://en.wikipedia.org/wiki/Telescoping_\(mechanics\)](https://en.wikipedia.org/wiki/Telescoping_(mechanics))

7. Appropriate Automotive: Lights The lighting system of a motor vehicle consists of lighting and signalling devices mounted or integrated at the front, rear, sides, and in some cases the top of a

motor vehicle. Particularly for capturing every bit clearly for this robot.

https://en.wikipedia.org/wiki/Automotive_lighting

8. Wireless Camera: Wireless security cameras are closed-circuit television (CCTV) cameras that transmit a video and audio signal to a wireless receiver through a radio band so that we can get the idea of the situation ahead and take decisions wisely.

https://en.wikipedia.org/wiki/Wireless_security_camera

9. Post Arrest Blast Mechanism: In many of the cases, if a device is seized, it can be used to trace the location of the operating body. To avoid any kind of information reveal, the robot will auto-blast on getting captured by the enemy.

10. Rest skeleton work of the robot would include a strong base, good gripping tires, durable body, etc.

Now if we pay heed to budget this robot, we can put a rough estimate of 1,00,000 INR. Even though India possesses a technological advantage, it is underutilized in every way. Several projects have been started on paper, but their implementation remains shaky. In light of the world's growth, and particularly in light of China's tremendous progress in the field, India must regard AI as a crucial component of national security.

CONCLUSION:

Several proposals might be made to enhance India's current robotics and AI situation. The first and most important step is to acknowledge the changing state of warfare as well as existing relationships with other countries, such as the ongoing tensions with China and Pakistan, and then to develop a realistic plan for meeting those needs using robotics in the Indian army.

Then there is an immediate need to prioritize research and development in this field, as well as adequate budget space to put the plans in place. India's intellectual skills must be recognized, and the IT sector, as well as educational institutions such as IITs, should be encouraged to build robots and AI devices to meet the army's needs. AI-based robotics, such as unmanned combat platforms and warships, are anticipated to provide different military advantages in battle action, targeting, collaterals, costs, economy, and so on, and should be given top priority for research.

Robotics and artificial intelligence (AI) have enormous potential in determining the nature of modern warfare, and India should recognize this as soon as possible so that it does not fall behind in the race for global leadership in this field and does not face significant battlefield disadvantages when compared to other major players. In the current circumstances, India is sick of big terror attacks, bomb explosions, and other forms of violence. TECHNOLOGICAL strength is required to overcome or avoid such terror assaults. It is our responsibility to take the initiative and build a model of a suitable robot that fits the needs of combatants. To prevent terrorist attacks and increase security at the border and in high-density areas, it is prudent to maintain world-class military technology in accordance with combatant requirements. In order to avoid such catastrophes, TECHNOLOGICAL power must outnumber HUMAN power.

The value of human life and time cannot be overstated. For their integrity and security, every nation requires its own defence system. The building of these robots in this manner will bring the nation's reputation and fame to the rest of the world.