# AI in Defence Sector

## Why in news?

Artificial Intelligence is shaping India's defence landscape providing a potential advantage in operations while also enhancing border security.

> *Artificial intelligence (AI) is when computers and other machines mimic human cognition, and are capable of learning, thinking, and making decisions or taking actions.*

## What are the applications of AI in defence sector?

- **Border Surveillance** - AI-based solutions will help in border surveillance by incorporating cameras, radar feeds, sensors etc.
- These advanced technologies help to detect border intrusions, target classification, and enhance the accuracy of defence operations.
- **Unmanned Aerial Vehicles** - From border control to comprehensive surveillance, drones equipped with AI-based aircraft technology excel in performing day and night reconnaissance missions.
- **Lethal Autonomous Weapon Systems (LAWS) -** With integrated sensor and pre-programmed algorithms, these systems aid in identifying, selecting, and tracking hostile targets.
- These weapons autonomously engage targets and contributes in reducing personnel requirement.
- **Autonomous armoured vehicles and robots** - These vehicles conduct unmanned real-time monitoring, casualty evacuation, and operational load delivery in challenging environments such as deserts and mountainous terrains.
- Robots excel in danger-prone and high-stress zones, surpassing human capabilities.
- **Data management**- AI can be used to process unused or underused data to provide more *actionable intelligence* for the Indian armed forces. It will enhance the Intelligence, Surveillance, and Reconnaissance (ISR) capabilities.

> *Project Maven, deployed in US, uses machine learning algorithm that scrutinize massive amounts of video data and provides credible intelligence for counter insurgency operations.*

- **Identifying patterns -** AI can be used to analyse data from multiple sources and identify patterns.
- It will be used to predict potential terrorist attacks and insurgent activities and then

recommend pre-emptive actions.

- **Training** - Training and simulation are diverse fields that employ system and software engineering ideas to create models that can assist soldiers in training on different fighting systems used in actual military operations.

*According to the Delhi Policy Group, the Indian military is allocating approximately US$50 million for AI spending each year.*

## What are the advantages of AI in defence sector?

- **Safety** - Reducing human casualties and risks
- **Adaptability** - It can be made adaptable to new threats by constant learning.
- **Improved decision-making –** More precise, faster situation assessments and analyses.
- **Emotions** - It offsets emotions and prejudices

## What are the challenges of using AI in defence sector?

- **Prejudices –** Prejudices can be inherent through biased algorithms
- **High cost of Implementation** - Given the complexity of engineering in building AI technology, these equipments' are highly expensive.
- **Lack of skill –** Requires skilled labour.
- **Ethical issues**- AI can raise questions about the responsibility, accountability, and transparency of military actions and decisions.
- For example, who is liable if an autonomous weapon causes harm or violates international law? How can we ensure that AI respects human dignity and rights?
- **Cyberattacks-** AI systems are vulnerable to hacking, manipulation, or sabotage by adversaries.

## Initiatives taken by Government to promote AI in defence sector

• **Roadmap -** NITI Aayog and the Ministry of Defence partnered to build a roadmap for integrating AI within the defence forces in 2018.
• **Defence Artificial Intelligence Council** - It is led by Ministry of Defence to provide overall guidance and support for projects involving cutting-edge technologies.
• **Defence AI Project Agency -** As per ***Chandrasekaran committee*** recommendation it was launched with an annual budget of 100 crores for AI programs to provide necessary guidance and structural support.
• **Defence India Startup Challenge** - It is under the Innovations for Defence Excellence (iDEX) programme which aims to fund startups that address AI, sophisticated imaging, sensor systems, big data analytics, autonomous unmanned systems, and secure communication systems, among other technologies for the defence forces.
• **WARDEC -** The Army Training Command has signed an MoU with Rashtriya Raksha University (RRU) to develop a Wargame Research and Development Centre (WARDEC) in New Delhi. It will be India's first simulation-based training centre.
• **India-US Defence Artificial Intelligence Dialogue**- During the recent 4$^{th}$ U.S.-India 2+2 Ministerial Dialogue between India and US Defence and External Affairs Minister, there was a call for increased collaboration.
• **AI in defence symposium**- Ministry of Defence launched 75 newly-developed AI technologies during the first-ever "AI in Defense" symposium where products like robotics, automation tools and intelligence surveillance were on display.
• **Agni-D**- It is an AI-based surveillance software developed by the Indian military for border security and threat detection which was unveiled at Aero India, one of Asia's largest air shows, in 2023. It was deployed in eastern Ladakh sector, a region of strategic importance due to its closeness to China.
• **Research institutions**- DRDO has three dedicated laboratories for application oriented research in AI in different domains.
• Centre for Artificial Intelligence and Robotics (CAIR), Bengaluru and
• DRDO Young Scientist Laboratory (DYSL)-AI and
• DRDO Young Scientist Laboratory (DYSL)-CT (Cognitive Technology)

## References


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