AI-Driven Borders Surveillance

How India is Using Advanced Tech to Watch to Monitor the Line of Control

**Anvitha NJ, TechSphere Insights,
May 2025, Volume 1, Issue 5, pp. 4–9.**

Introduction

India is a wide country with a variety of land types, including rivers, forests, deserts, and even snow-capped mountains. The borders are long and difficult to keep track of as a result. The Line of Control between India and Pakistan is one of the most dangerous borders. This has always been a complicated area. Even though the weather is terrible and their lives are extremely difficult, Indian soldiers have been protecting us here for many years. But now, things are changing. With the help of technology, especially something called Artificial Intelligence (AI), India is improving the way it guards the border. As a student from this generation, I always assumed that artificial intelligence was limited to apps or mobile devices. However, I was shocked to learn that it's also being used to support our troops at the borders. I became more interested and wanted to learn more as a result. That's when I started reading about it. I'm writing this article to share what I learned and how this technology may affect our country's safety in the future, because I found it to be fascinating.

Why Are Borders Difficult to Protect?

It is difficult to protect India's borders. Particularly in Jammu and Kashmir along the Line of Control, the terrain is forested, hilly, and snowy. Attempts to cross the border illegally are also common, and sometimes there are even assaults. The army has always been there to put an end to all of this, despite its numerous problems.. It's dangerous, chilly, and dark. While standard methods like installing watch towers, sending soldiers around, or erecting fences are helpful, they are no longer sufficient. Artificial Intelligence (AI) is being used in conjunction with new tools.
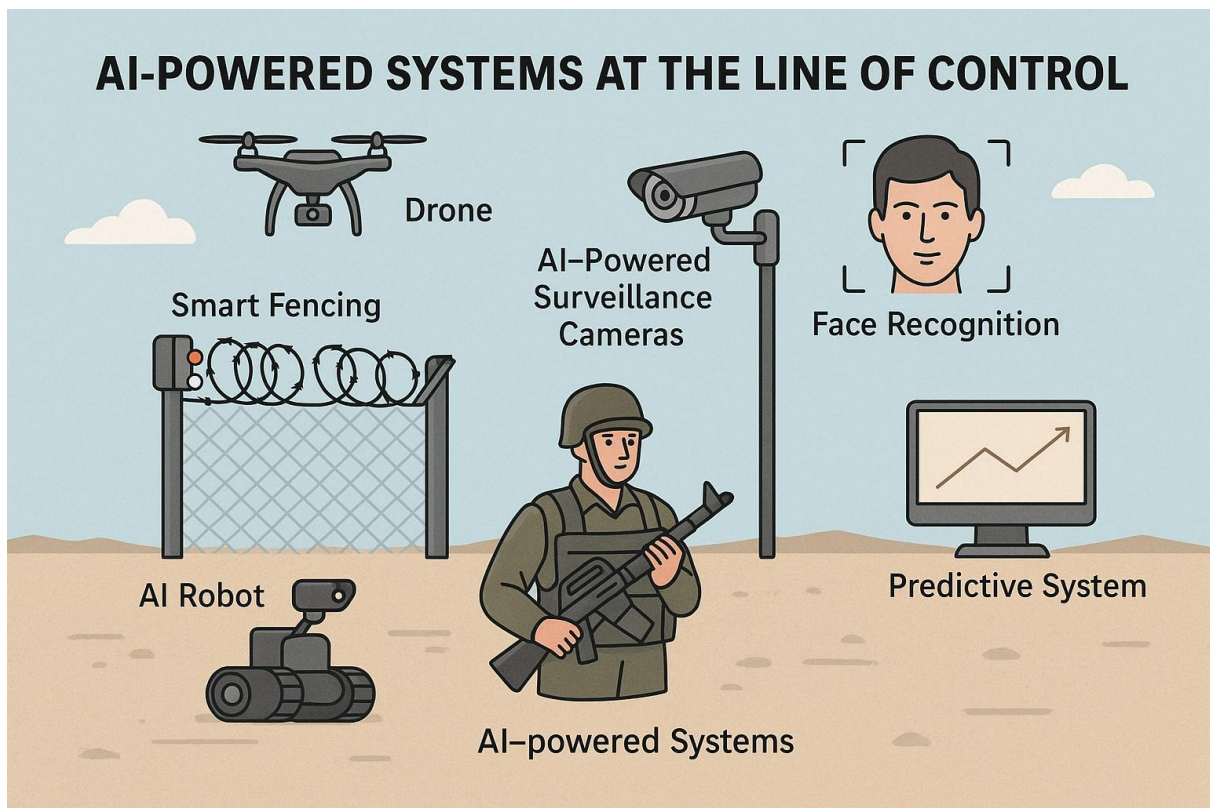
What is AI, and Why Is It Useful Here?

Artificial Intelligence (AI) is essentially the ability of machines or computers to think and act like humans. For example, AI can identify a person in a picture or understand possible outcomes by studying patterns. At the border, AI is being used to monitor large areas all the time, recognize faces, detect movement even in dim light or fog, and guess when or where someone might try to cross. If something unusual happens, AI can quickly send an alert to the soldiers. This doesn't mean that AI is taking the place of soldiers, but it is being used as a tool to help them do their jobs more effectively and safely.

AI Resources Used at the LoC

- Smart Fencing (CIBMS) - Uses thermal cameras, sensors, and alarms to spot movement.
- Drones (UAVs) - Fly over rough terrain and send live video to the base.
- Smart Surveillance Cameras - Detect heat and motion, even in low light or fog.

- Face Recognition Software - Matches faces with criminal records to find suspects.

- AI Robots - Small robots with cameras used in dangerous areas.

- Predictive Systems - Study old data to guess where problems might happen.

AI-POWERED SYSTEMS AT THE LINE OF CONTROL

Drone

Smart Fencing

AI–Powered Surveillance Cameras

Face Recognition

AI Robot

Predictive System

AI–powered Systems

Advantages of AI at the LoC

- Works 24/7 – Never gets tired, active day and night.

- Fast Alerts – Sends quick notifications for action.

- Protects Soldiers – Robots and drones take the lead in risky zones.

- Weather-Resistant – Functions in snow, fog, and darkness.

- Covers More Ground – Monitors wider areas than humans can.

Challenges of Using AI

- High Cost – Expensive to install and maintain.

- Needs Power & Network – May not work well in remote zones.

- Cyber Risk – Needs strong protection from hacking.

- Training Needed – Soldiers must learn to use the tech.

- Weather Limits – Can be affected by heavy snow or storms.

What Kind of Tech Is India Using at the LoCsSW?

To protect the borders, India has started using many new AI-based technologies like smart fencing, also called CIBMS, which is a digital fence with cameras, sensors, and heat detectors that send a message to the control room if someone tries to cross. Another technology is drones or UAVs, which are small flying machines that take pictures and videos of the border area and, with the help of AI can even follow moving objects, making them useful in places that are hard for people to reach. Smart cameras are also used, and they can work in the dark or fog because they detect heat; AI helps them understand whether the movement is from a person or just an animal. Face recognition checks a person's face with a criminal list if they try to enter, helping catch known criminals. In risky areas, small robots with cameras and sensors are sent that can move around safely, avoid things like rocks or trees, and send back videos or sounds with the help of AI. Prediction systems use old data like when and where someone tried to cross before, and guess when it might happen again, so soldiers can be ready in advance.

How Does This Help the Army?

The use of AI has many benefits. To begin with, these machines never tire. They can continue to watch around the clock. AI quickly notifies the soldiers so they can take appropriate action if something odd occurs. Time and possibly even lives are saved in this way. Additionally, soldiers don't always have to put themselves in risky situations when drones or robots are used in hazardous areas. The sensors and smart tools don't get tired or confused, and they can sometimes be more accurate than human eyes. Because fewer workers are required to complete the work, this technology saves money over time even though it initially costs a lot to set up.

What Are the Problems with Using AI at the Border?

Even though AI sounds really cool, it's not perfect. First, things like drones and smart fences are very expensive. That's why they can't be used on every part of the border right now.

Also, machines can make mistakes. For example, if there's fog or snow, the cameras and sensors might not work properly.

Another problem is hacking. Since these tools use computers, someone from outside could break in, stop the system, or steal important information. That's a big risk.

And finally, soldiers have to learn how to use all this new technology. Learning takes time, and not everyone finds it easy. But the good thing is that India is trying to fix all these problems.

What Is the Government Doing?

The Defence Research and Development Organization (DRDO) and the Indian government are working to make sure that India develops its own artificial intelligence (AI) tools. As part of the "Make in India" movement, Indian businesses are producing sensors, software, and intelligent drones. This lessens our reliance on foreign technology.

Some of these AI tools were successfully tested and placed on the Jammu and Kashmir border in 2023. The army now intends to use them anywhere else as well because of how well they worked.

Why This Matters to Me as a Student?

As someone who's studying now, it really surprised me to know that the same kind of technology used in social media filters or games is also being used to protect our country. It makes me feel proud and also curious. Maybe in the future, students like me can be part of building these tools. Fashion Communication may be about design and stories, but stories like these show how powerful tech and teamwork can be.

Conclusion

For India, using AI at the LoC is a significant step. It makes our soldiers safer and more productive. AI is typically used in phones and video games, but it is now also being used at the border. Although there are still some issues, India is making efforts to resolve them. This piqued my interest as a student. It demonstrates how technology and people can cooperate to safeguard our nation.