

ICRTME25-164

**Smart Weapon Detection with Real-time SOS Alert**Vijitha S, Harikrishnan V<sup>\*</sup>, Hari Kumar K*Department of Computer Science Engineering (Data Science), Vels Institute of Science,  
Technology & Advanced Studies (VISTAS), Chennai*

Corresponding author E-mail: hari0087892@gmail.com

**ABSTRACT**

Public safety and security are critical concerns in today's society, particularly in crowded spaces such as educational institutions, transportation hubs, and public gatherings. The advancement of Artificial Intelligence (AI) and Machine Learning (ML) offers transformative solutions to these challenges. This project proposes a real-time weapon detection system leveraging deep learning models and computer vision techniques to identify potential threats accurately and efficiently. By integrating YOLOv5 for object detection with OpenCV for video stream analysis, the system detects weapons such as knives and firearms in surveillance footage. An additional feature includes Optical Character Recognition (OCR)-based number plate detection, enhancing traceability and law enforcement response. The solution emphasizes lightweight deployment, enabling integration into existing CCTV infrastructures for Industry 5.0-ready smart surveillance systems. Experimental evaluations demonstrate promising accuracy in detecting concealed and visible weapons under varied environmental conditions. This AI-driven approach not only contributes to automation and robotics in safety engineering but also supports sustainable technology adoption by reducing dependency on manual monitoring. The proposed system exemplifies how Machine Learning and Artificial Intelligence in automation can enhance societal security. In the mechanical field, An AI-powered weapon detection system can be integrated with existing CCTV and automation infrastructure to prevent unauthorized weapon entry, protect workers, and enhance overall safety standards in Industry 5.0-enabled smart factories.

**Keywords:** Weapon detection, Real-time alert, SOS notification, Mechanical automation, Deep learning.



978-81-992034-1-9

**DEPARTMENT OF MECHANICAL ENGINEERING  
VISTAS, CHENNAI, INDIA**