



Gun Detection Technology

 **Assert AI**

INTRODUCTION

Gun violence has recently been a matter of concern in the U.S. With easy access to firearms and slow response of the officials, gun violence has led to the death of thousands of people in the last few years alone. Guns have become a part of the U.S. culture and the situation is getting worse. CDC's data for 2020 reveals that 45,222 people died from gun-related injuries.

Gun violence is a real threat. It needs to be controlled before it takes over the world. To solve this problem, Assert AI has developed Gun Detection technology combining the power of AI and ML.

Gun detection is a method for the identification of firearms using AI Vision. With the evolving AI and machine learning technology, gun detection can identify or prevent misconduct or misuse of weapons in public places by immediately notifying the designated officials as soon as the gun is visible to the cameras.

With machine learning, gun detection built into cameras can identify different firearms in different environments easily. With 99.6% detection accuracy, it reduces the chances of false alarms. Within 5 seconds, it identifies the weapon and informs the officials.

Importance of Computer Vision and Gun Detection

According to the Gun Violence Archive, 45,222 people died from gun-related injuries in 2020. And every year, the death count is increasing.

An International Comparison of Gun - Related Killing As A % of All Homicides

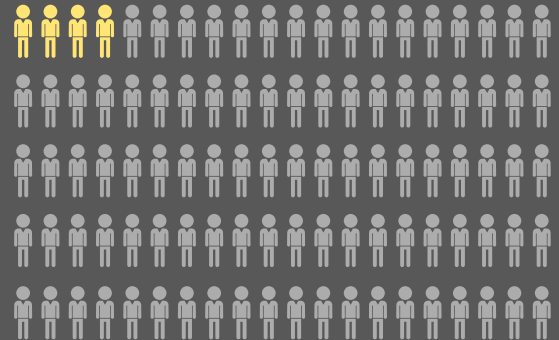
US 2020

79%



UK 2020

4%



Canada 2020

37%



Australia 2020

13%



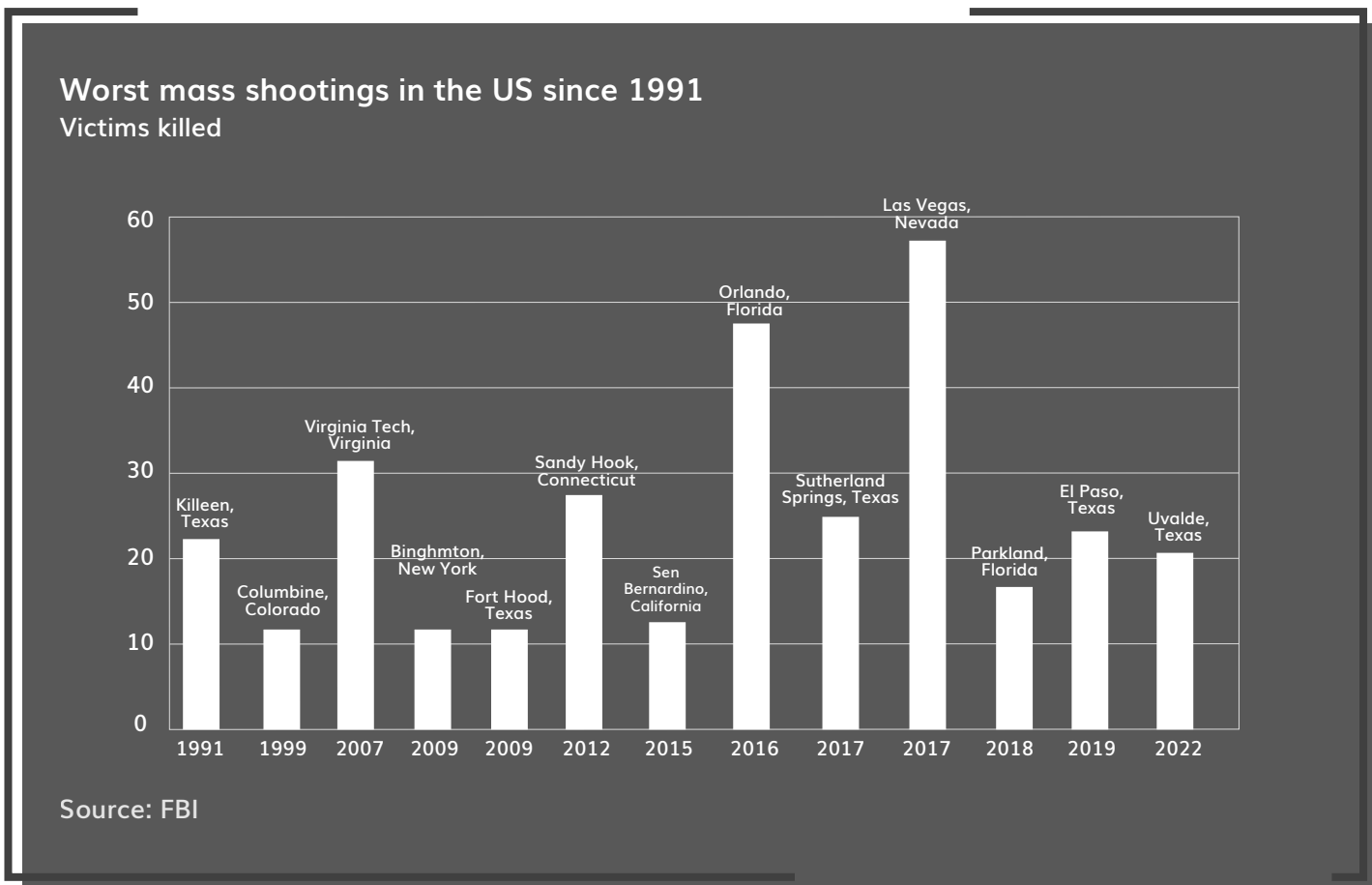
Source: CDC, House of Commons, Statistics Canada, Australian Institute of Criminology

With the ever-growing population and their data, it is impossible to track everything in real-time. Computer vision aims to solve this problem.

- ▶ Review more footages and detect more incidents through AI than manual monitoring
- ▶ The machine learning method quickly identify and detect weapons
- ▶ Review incidents over time to further improve AI and check crime
- ▶ Integrate with incident response systems for quick response time
- ▶ Drive real-time action to reduce violence and improve security & law enforcement

WHY IS THIS TECHNOLOGY A LIFE-SAVER?

On July 4, more than 220 people were shot and killed, and close to 570 were wounded at Chicago gun violence. Such instances lead to thousands of deaths in the U.S. every year.



As per the data from The Gun Violence Archive, 15000 people were killed in 2016 due to gun violence. The latest data from 2021 reported more than 20000 deaths. Assassination in political rallies and shootings in public areas have become common all over the country. With easy access to firearms, why wouldn't it be?

Preventing these events before a calamity happens is necessary, or these catastrophic events will continue to occur.

Gun Detection can prevent crime by detecting the presence of guns and spotting trends of a gun firing. This detection data is immediately sent to the authorities to help them make strategic and tactical decisions to prevent the happenings of a catastrophic event in real-time.

SCIENCE BEHIND AI BASED WEAPON DETECTION

Deep Learning Algorithms

AI technology uses a convolutional neural network (CNN) to replicate how a human brain process information. Deep learning algorithms can take in a raw input image and assign learnable weights and biases to various aspects of the image. It can extract high-level features such as edges from an image. This works by applying the convolutional filter repeatedly over the raw footage.

Cutting-Edge Data Science

The algorithm is trained to recognize weapons from hundreds of thousands of videos in a proprietary data set. The product can be integrated with law enforcement agencies (911 in the USA) and security personnel to help them take appropriate action to neutralize the threat.

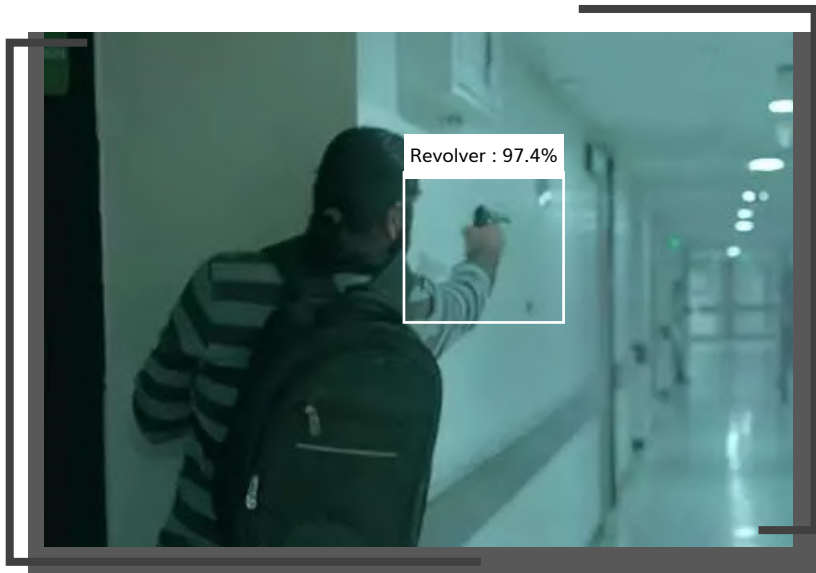


Unparalleled Accuracy

With machine learning, AI vision tech is trained to spot and identify firearms. It helps in real-time weapon detection with 99.6% accuracy, and immediate response on gun tracking. The system automatically identifies weapons in camera footage instantly with high accuracy rate that minimizes the possibility of false alarms. The high accuracy typically ensures the possible harm is identified and countered before occurrence thus saving many innocent lives and preventing any other collateral damage.

WHAT MAKES GUN DETECTION CHALLENGING?

Technology is evolving and so are we. In computer vision, gun detection via AI is a complex process. It comes with various challenges. Achieving accurate detection rate, accuracy, and detection time becomes challenging.



Below mentioned reasons add more to the challenges to achieving accuracy via gun detection:

- ▶ Lighting and layout
- ▶ Complex backgrounds
- ▶ Low camera resolution
- ▶ Distance
- ▶ Multiple faces in the same frame

SOLUTIONS

AI can colorize images for a natural and clear look

Night vision cameras are equipped with infrared sensors. With the use of AI, these sensors enable the cameras to see through the dark.

AI functions using machine vision

AI program is trained with multiple images and footage comprising different postures, backgrounds, angles, movements, and colors so cameras can detect firearms in the most complex environment.

Next-Gen AI

Gun detection algorithm installed in cameras uses AI to enhance images, sharpen blurry environments, capture true colors, and improve overall scene recognition.

APPLICATIONS OF AI BASED ON GUN DETECTION



Training and Skill Development

With the help of gun detection, people carrying any firearm or all weapons the AI model is trained for can be detected and caught before they cause any catastrophic event. This can help in the preparedness of personnel or first responders dealing with such circumstances.

Priority Security

Continuous monitoring via AI can detect the presence of firearms or unusual actions and human behaviors. Suspicion on questionable people will help by prohibiting their access to classified areas.

Ensures Safety

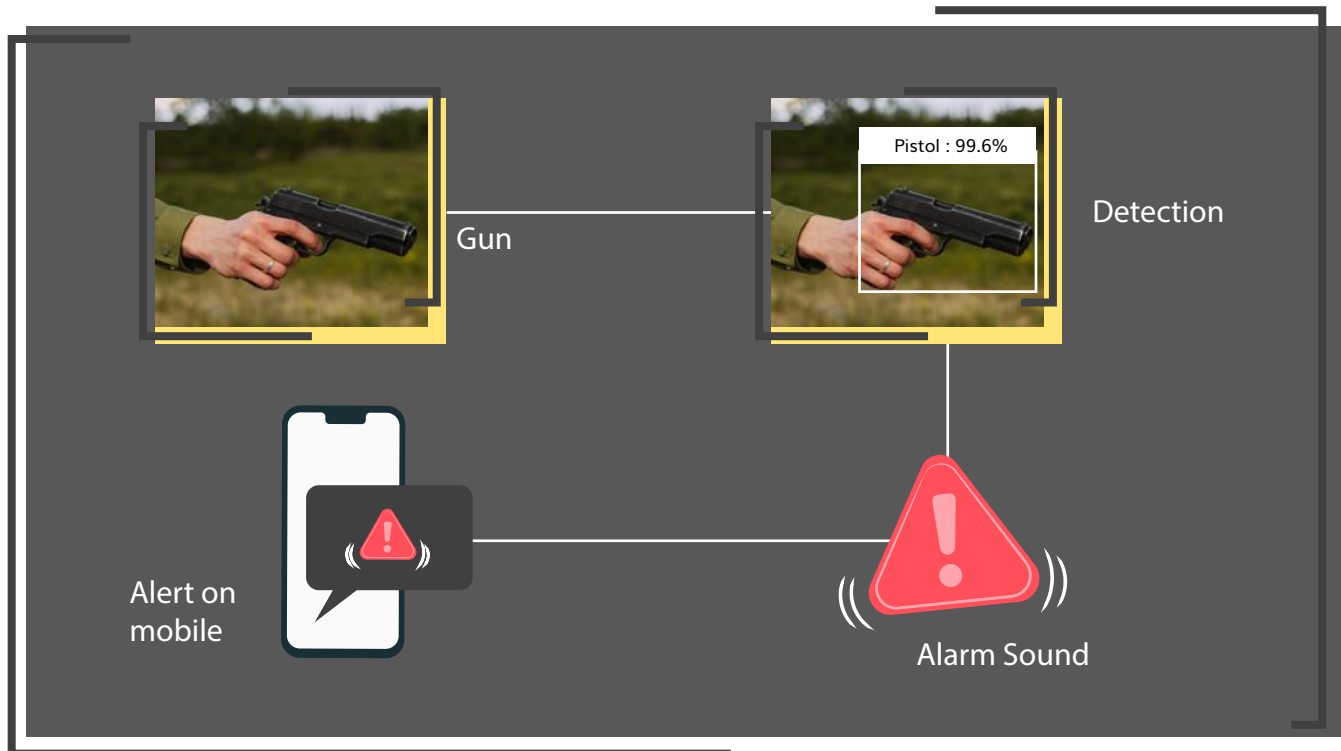
Cameras are integrated with gun detection technology to identify suspects and immediately alert the officials by sounding an alert. And this ensures the suspect is caught and convicted of their crime with the help of digital evidence.

VIP Protection

Gun violence is mostly seen in public rallies and political events. These events have many VIP officials. To protect and ensure high class security of the VIPs, gun detection will sound alarm and alert the officials as any firearm is detected.

Saving Lives

Security is the main concern in schools, colleges, airports and public places. To help, prevent and respond to gun violence, adopting Gun Detection technology is the only viable solution. AI can identify a gun from a surveillance camera feed and send a warning of the subject, location, and the weapon they're armed with, to onsite security personnel and to the law enforcement officials. This will help them take necessary actions and save lives.



USE CASES OF GUN DETECTION

Rapid Response

Chances of a witness not responding or informing about a crime to the officials on time is very likely. And they shouldn't be blamed for this, as such events cause panic. If the officials are informed within seconds of weapon detection, chances of controlling the situation are high.

AI vision in gun detection informs and alerts the officials as soon as they detect a gun or any firearm threat.

Problem Solving

Gun detection tech is integrated into surveillance cameras, so researchers and programmers can review the footage of such events to improve security. Based on demographics and other beneficial information from the footage, hotspots can be located to prevent crime before it happens.

Assert AI

At Assert AI, we aim to provide world-class accuracy, error-reduction, and time efficiency. Challenges in these key areas led to the conception of Computer Vision based Weapon Detection Technology.

Pioneering the latest technology and using innovative solutions to overcome all challenges, we embed and use advanced deep learning models, algorithms, and programs to develop the best gun detection solution.

CONCLUSION

At Assert AI, we empower computers and cameras with AI vision. We integrate algorithms to process the visual inputs that identify and process things simulating a human vision, sans human error.

Our artificial intelligence-based video analytics solutions help in prevention of events like gun violence. The AI vision tech is developed to prevent and reduce crime by detecting firearms and reducing response time. With the most efficient and analytical algorithms used, our Gun Detection technology is the world's best technology in AI Gun Detection.

Gun detection technology can solve some of the ubiquitous challenges in operations, crime prevention, and security workflows that can save thousands of lives every year. The need for gun detection is never more than now. With the increase in crime rate every year, adopting this technology can save thousands of lives. Eventually, we can leave a safer world for our children by adopting Gun Detection.