Project Title : Real Time Violence Detection model with Alert System

Problem statement:
In today's society, ensuring public safety and security is of paramount importance. However, the prevalence of violent incidents in public spaces poses significant challenges for law enforcement agencies and security personnel. Traditional surveillance methods often lack the capability to promptly detect and respond to such incidents, leading to potential risks and delays in intervention.

To address this issue, there is a need for an efficient and accurate violence detection system that can analyze video streams in real-time and identify instances of violence with high precision. Leveraging advancements in deep learning and computer vision technologies, such a system can provide valuable assistance to security personnel by enabling proactive monitoring and early intervention in potentially dangerous situations.

The proposed project aims to develop a real-time violence detection system using the MobileNetV2 model, known for its efficiency and high accuracy in image classification tasks. By training the MobileNetV2 model on a dataset consisting of videos depicting both violent and non-violent behavior, the system seeks to learn to distinguish between normal and violent activities accurately.
Through the development and implementation of such a system, the project aims to contribute to the advancement of technology-driven solutions for public safety and security, ultimately leading to safer environments for communities and individuals.

DataSet Link : **Real Life Violence Situations Dataset**

Literature Work :
We have gone through many research papers related to anomaly detection.
And decided to make the aim of our project to detect the Violence in a video with an alert system, as violence is also a type of anomaly.
Some of the paper's link are:

1. **Attention-based residual autoencoder for video anomaly detection**
2. **Security Threats to Artificial Intelligence-Driven Wireless Communication Systems**
3. **Real-world Anomaly Detection in Surveillance Videos**

Readme:

We have successfully implemented a violence detection system using video input and leveraging the MobileNetV2 model. This advanced model, known for its efficiency and high accuracy, enables real-time analysis of video content to identify instances of violence.

MobileNetV2, with its lightweight architecture, allows for swift processing of frames, making it well-suited for video analysis applications. Our violence detection system employs sophisticated deep learning techniques to recognize patterns and distinguish between normal and violent behavior within the input video streams. This technology not only enhances security measures by promptly identifying potential threats but also contributes to the development of safer environments by proactively preventing and addressing violent incidents. Overall, our utilization of MobileNetV2 underscores our commitment to leveraging cutting-edge technologies for the advancement of video-based violence detection, with implications for improved public safety and security.

We have use 350 videos of each violence and non violence to train our MobileNetV2 model for Then test it on the model whose accuracy is 96%, although some times it give wrong prediction in some frames.
First we take videos and convert it into frame and then we train the model on basis of the video and after that we run it for 50 epochs, then plotting the AUC curve and confusion matrix nad saving the model.h file.
After that we test the model on another colab file by importing the saved .h file and testing on the violence and non violence video for prediction.
Then after the we created another another colab file for alert generation in which we detect the face, date, time of the person who creates the violence in the video if found.

Contribution of Members :

Aditya Kumar(2021UCA1824) - Model training from the image frames, model testing, graph plotting and Alert System generation over detecting violence.

Aditi Dagar (2021UCA1842) - Idea pitching, Finding Dataset, Data preprocessing and cleaning and video to frame part of code.