



# VIOLENCE DETECTION MODEL AND ALERT SYSTEM

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## Introduction

- Violence is a major cause of rising crime in India.
- Globally, almost 1 in 3 women have experienced physical abuse, and over 1 in 3 students aged 13–15 face bullying.
- While surveillance cameras are widely deployed, manual monitoring is inefficient in detecting real-time violence.
- There is a growing demand for intelligent systems that can automatically detect violent behavior and raise instant alerts.
- We propose a deep learning-based approach using MobileNetV2 + LSTM for spatio-temporal analysis of violent actions in video data.
- Upon detecting violence, the system sends instant alerts including an image, timestamp, and location to a Telegram bot for immediate response.

## Proposed Model

- We propose a hybrid violence detection model that combines MobileNetV2 for spatial feature extraction with LSTM for temporal sequence learning.
- The model is trained on augmented video frames using Albumentations to improve generalization.
- It is developed using TensorFlow libraries and optimized with callbacks and hyperparameter tuning to enhance accuracy and prevent overfitting.
- Upon detecting violence, the system sends detection outputs image, timestamp, and location to a Telegram Bot for real-time alert.

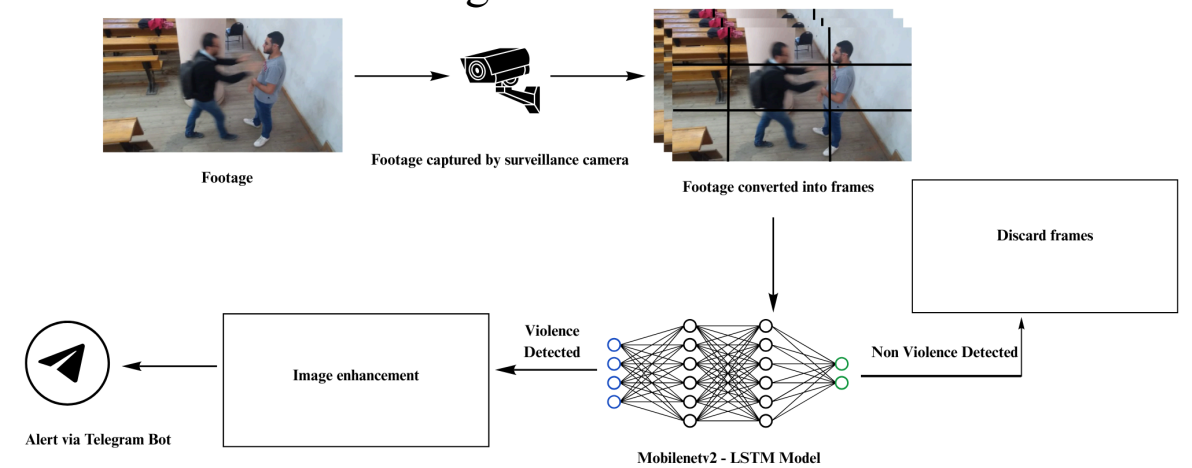


Fig.1.Framework of our Model

## Application

This model demonstrates a significant improvement in detecting violent scenarios by utilizing advanced neural networks commonly used in deep learning. With the addition of data augmentation and callbacks, our base model—built using MobileNetV2 and LSTM—shows a 6% improvement in accuracy and achieves a high AUC score of 98.24%. The model was trained on 1,600 videos (800 violent and 800 non-violent). The accuracy difference between the training and testing sets is just 2%, indicating no signs of overfitting and demonstrating strong generalization capability.

Additionally, we have integrated a Telegram Bot to send real-time alert messages upon violence detection.

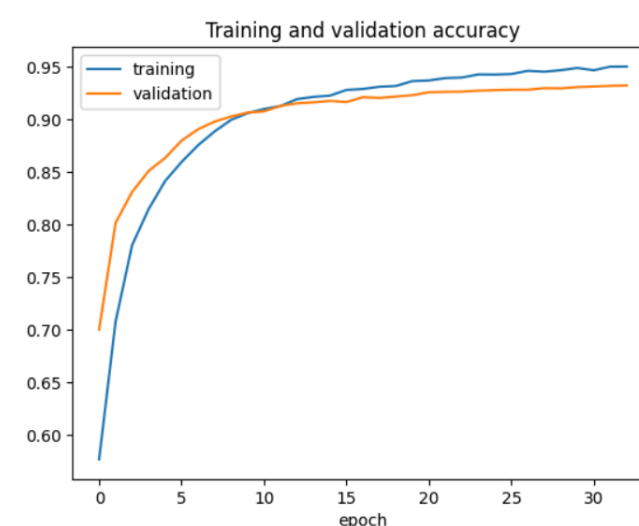


Fig.2.Traing and Validation Accuracy

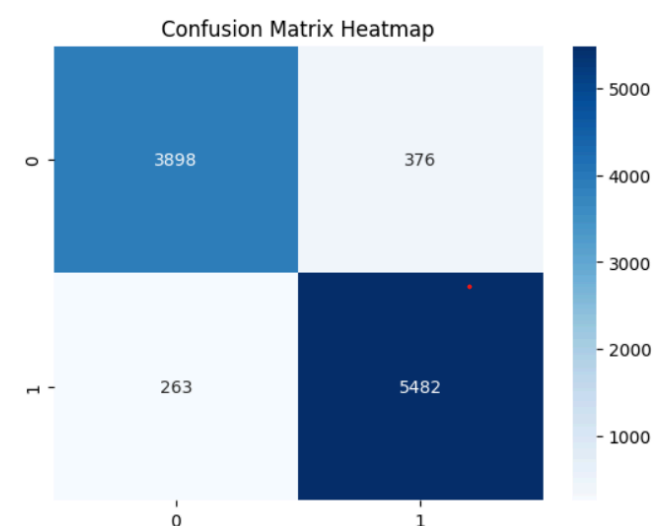


Fig.3.Confusion Matrix

## Expected Outcome

- Detect violent activity in video frames with high accuracy and precision.
- Instantly send alert messages via telegrambot.
- Callbacks ensure model is not overfitting.
- Guarantee strong performance across diverse conditions.
- Due to lightweight in nature it can detect in real time on edge devices.

## References

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