REAL-TIME VIOLENCE ALERT SYSTEM

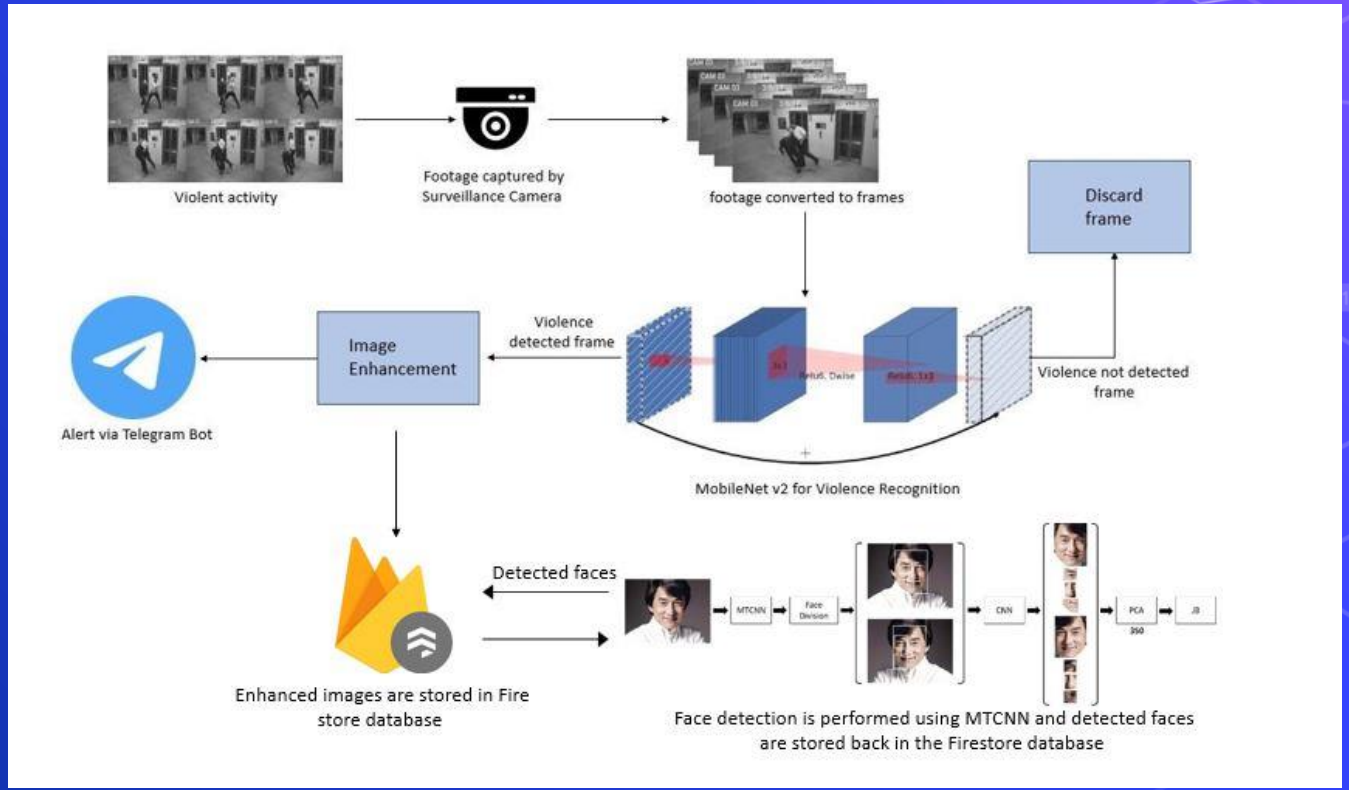
Guide : Ms. Jayalekshmi J
Co-guide : Ms. Dhanya L K

Presented By
- Ben Sam Sabu S8 CS2 17
- C J Peter S8 CS2 18
- Govind B Chandran S8 CS2 22
- Mannu Thomas S8 CS2 35

Problem Statement

- CCTV Surveillance is used to a greater extent but still it lacks the feature of automatic violence detection
- Manual monitoring is not a feasible task and the time taken to respond to the situation is also crucial
- A Real-Time violence alert is proposed

Architecture Diagram



Alert Module

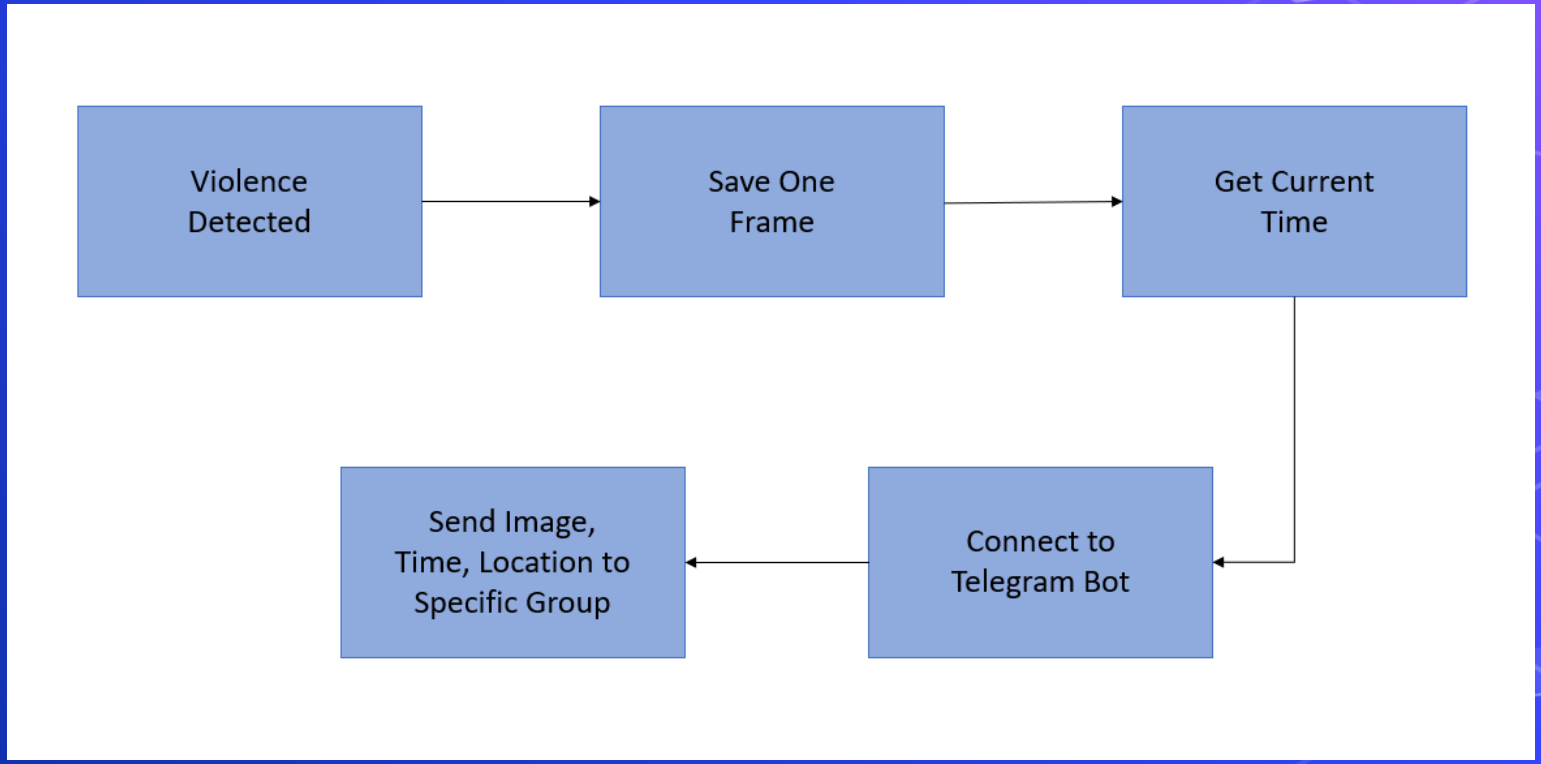


Image Enhancement

- Sharpness and color of obtained output frames is slightly improved
- Uses inbuilt functions – Python PIL Library
- Helps authorities in face detection & cross-checking

Face Detection

- MTCNN and Pyplot are used
- MTCNN consists of 3 stages of CNN for face detection and face alignment
- Pyplot is a submodule of the matplot library

Methodology

- A dataset having 1000 videos each of violence category and non-violence category was chosen
- A model was trained using MobileNetV2 using the dataset
- Real-time video footage is given as input
- Output is obtained as image frames

MobileNet V2

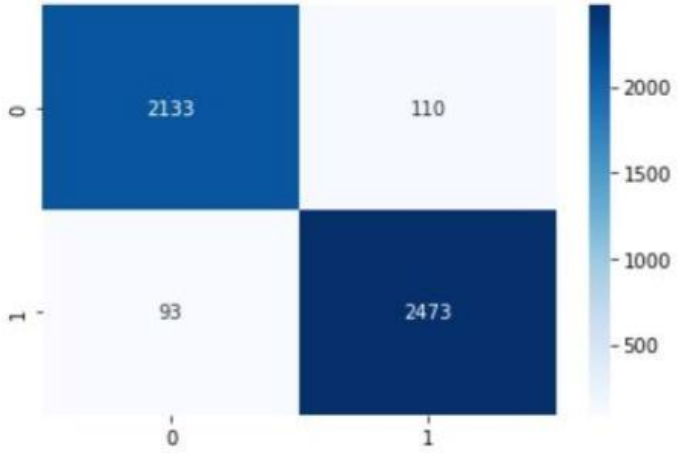
- Convolutional neural network that is 53 layers deep
- Provides real-time classification capabilities under computing constraints in devices like smartphones.
- Utilizes an inverted residual structure where the input and output of the residual blocks are thin bottleneck layers.
- Uses lightweight convolutions to filter features in the expansion layer.

Firebase

- Built by Google
- Provides services like Storage, Analysis, Machine Learning etc.
- Firebase storage bucket is used to store the image
- Links are obtained for the images and stored in firestore along with date and time

Results

> Correct Predictions: 4606
> Wrong Predictions: 203



	precision	recall	f1-score
NonViolence	0.96	0.95	0.95
Violence	0.96	0.96	0.96
accuracy			0.96
macro avg	0.96	0.96	0.96

Results


Violencebot
VIOLENCE ALERT!!
LOCATION: MANNANTHALA
TIME: 2022-05-05 06:28:16.849872 11:58 AM
Violence: True
11:58 AM

References

- [1] Mi Young Lee, Ijaz Ul Haq, Seungmin Rho, Sung Wook Baik, and Samee Ullah Khan Cover the Violence: A Novel Deep-Learning-Based Approach Towards Violence-Detection in Movies, MDPI Article Received: 3 October 2019; Accepted: 7 November 2019; Published: 18 November 2019
- [2] M. -S. Kang, R. -H. Park and H. -M. Park, "Efficient Spatio-Temporal Modeling Methods for Real-Time Violence Recognition," in IEEE Access, vol. 9, pp. 76270-76285, 2021, doi: 10.1109/ACCESS.2021.3083273, Date of Publication: 25 May 2021.
- [3] Zhou P, Ding Q, Luo H, Hou X (2018) Violence detection in surveillance video using lowlevel features. PLoS ONE 13(10): e0203668. https://doi.org/10.1371/journal.pone.0203668, Published: October 3, 2018[4]https://towardsdatascience.com/review-mobilenetv2-light-weight-model-image-classification-8febb490e61c
- [4]https://towardsdatascience.com/review-mobilenetv2-light-weight-model-image-classification-8febb490e61c

Thank You