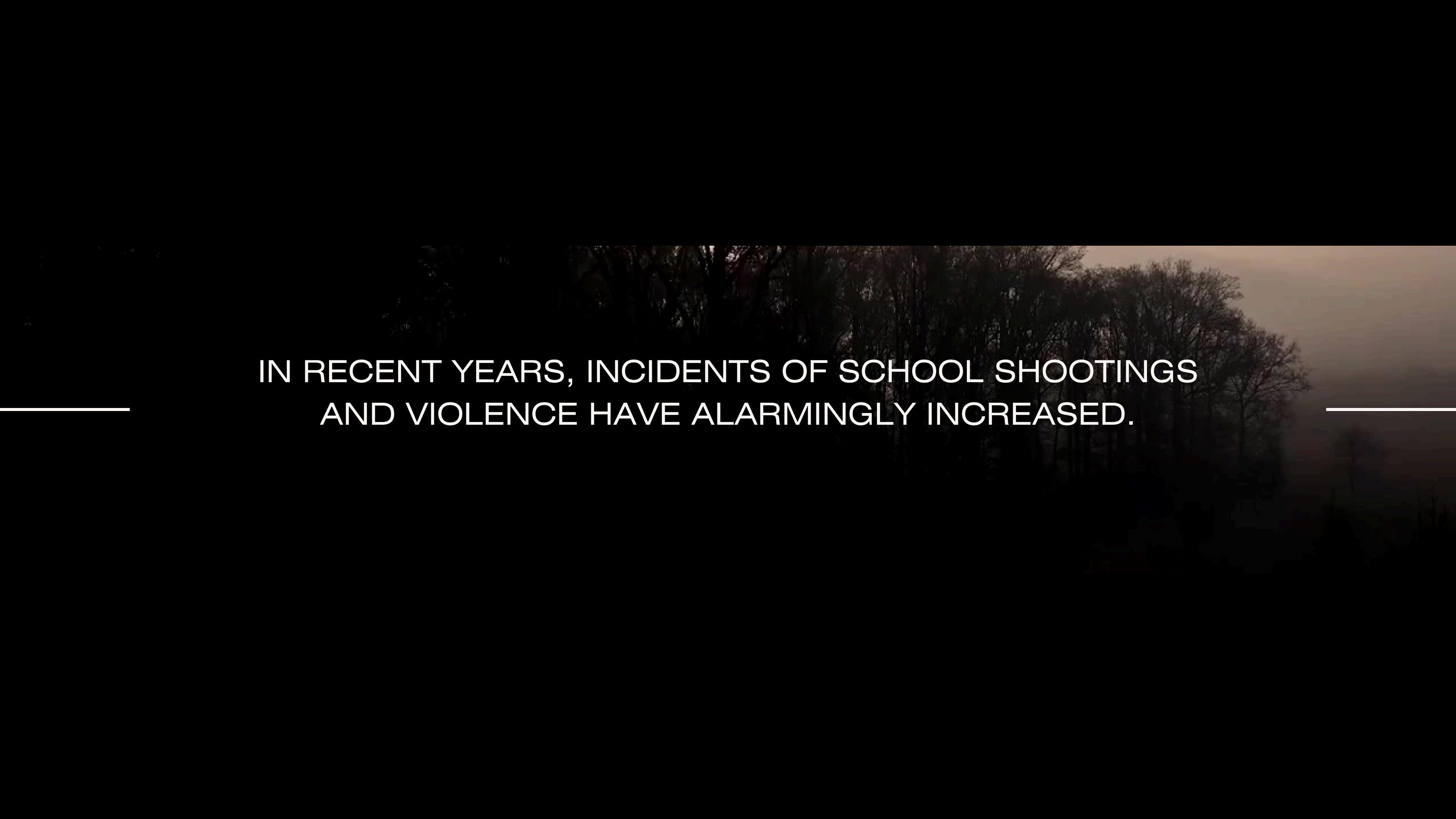




SAFEVISION-AI

**Weapon, Violence
Face Emotion
Detection**



IN RECENT YEARS, INCIDENTS OF SCHOOL SHOOTINGS
AND VIOLENCE HAVE ALARMINGLY INCREASED.



To address this critical issue, students from the Department of Applied Artificial Intelligence and Machine Learning at Conestoga College, Waterloo Campus, have developed an innovative application called SafeVision-AI.



Angel
Data Analyst

D e v e l o p e r



Christina
Software

D e v e l o p e r



Arya
Scrum Master

Quality and Tech
Engineer



Prasant

Quality and Tech
Engineer

USE CASE-1

WEAPON



USE CASE-2

VIOLENCE

DETECTION



o

USE CASE-3

**FACE
EMOTION**



WEAPON DETECTION

Objective:

- Detect weapons (e.g., handguns, knives, fire) in video streams.
- Trigger Email Alerts when a weapon is detected.

Methodology:

- Model: YOLOv5 (Pre-trained Custom Model).

Process:

- Capture frames from the video stream.
- Run YOLO detection on each frame to identify threats.
- If a weapon is detected:
 - Save the frame as an image.
 - Send an email alert with the detected frame as an attachment.

VIOLENCE DETECTION

Objective:

- Build a binary classification model to detect Violence vs. Non-Violence in images.

Dataset:

- Preprocessing:
 - Images resized to 224x224 pixels.
 - Data Split: Train Data: 80% Validation Data: 20%

- Applied normalization:

- Mean = [0.485, 0.456, 0.406]
 - Std = [0.229, 0.224, 0.225]

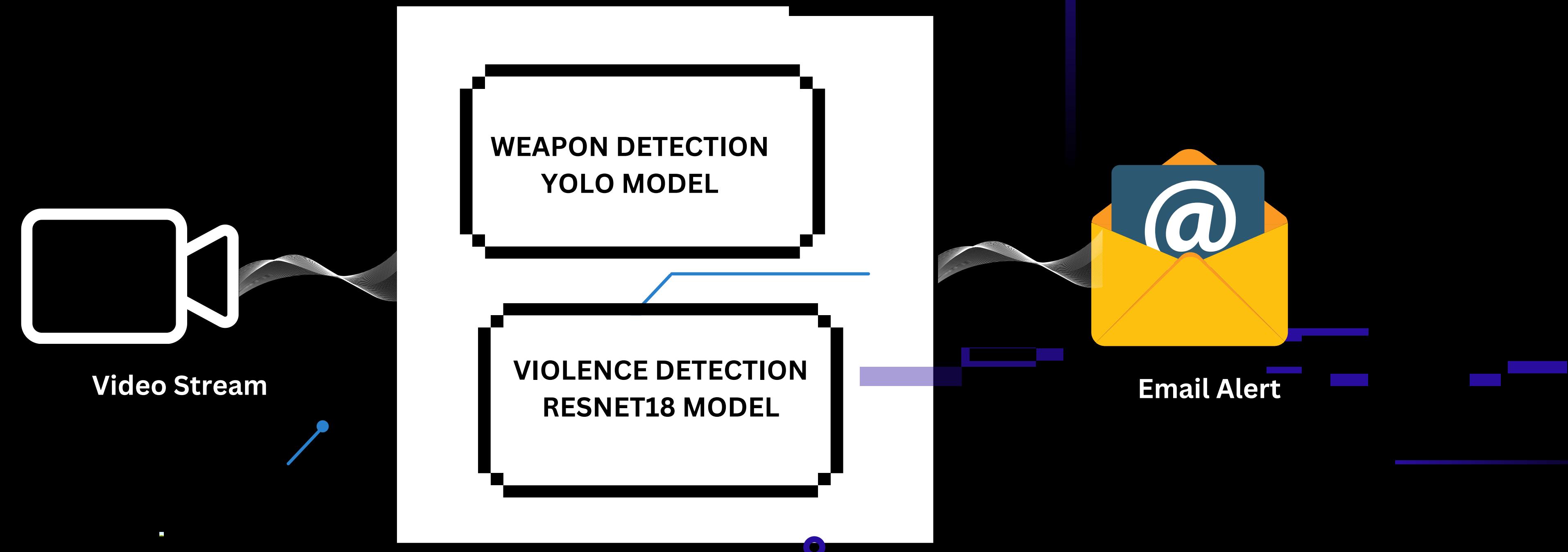
Training

- Epochs: 10
- Batch Size: 16
- Optimizer: Adam (Learning Rate = 0.001).
- Loss Function: Cross-Entropy Loss.

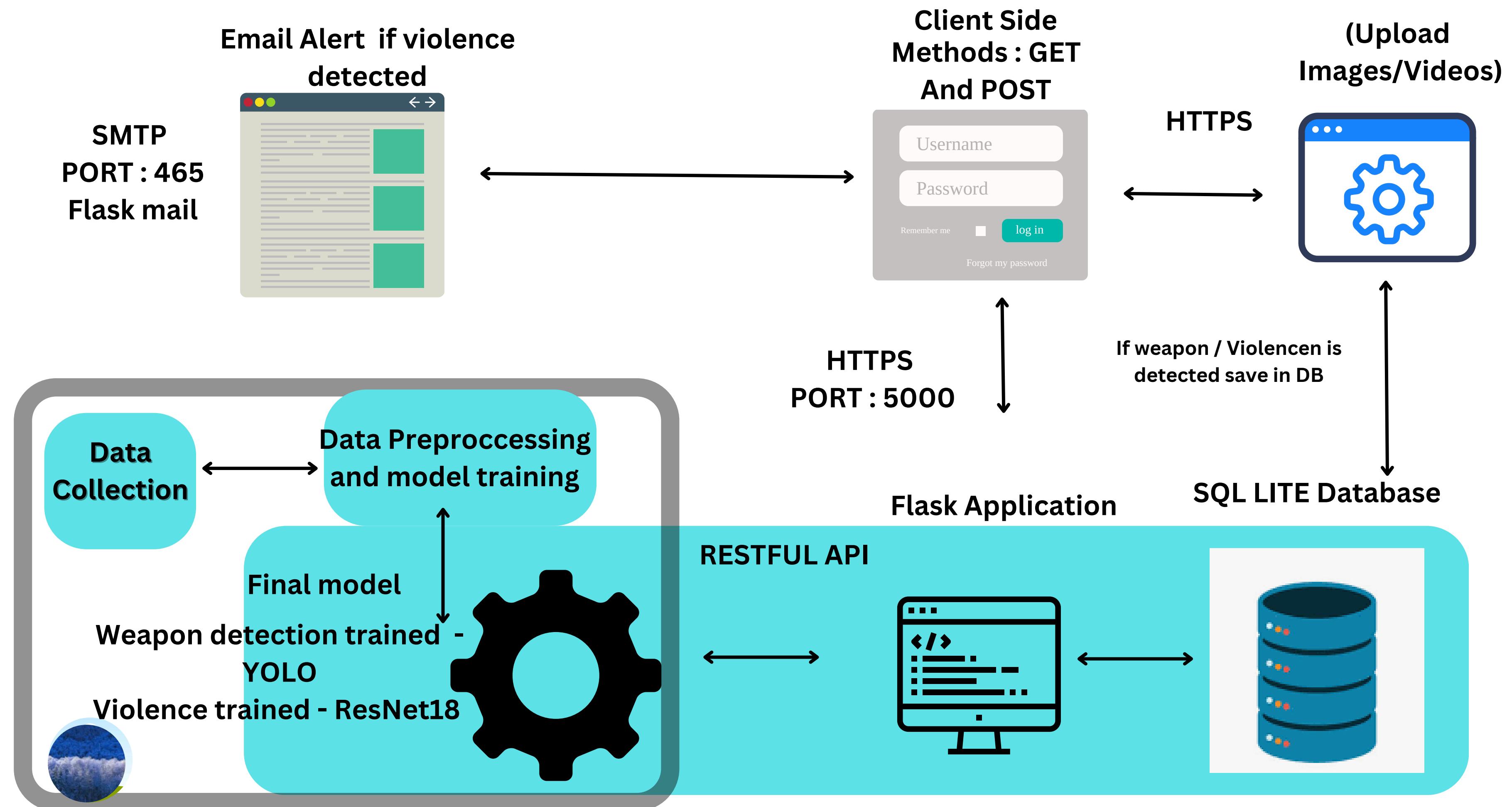
Base Model: ResNet18

WEAPON & VIOLENCE

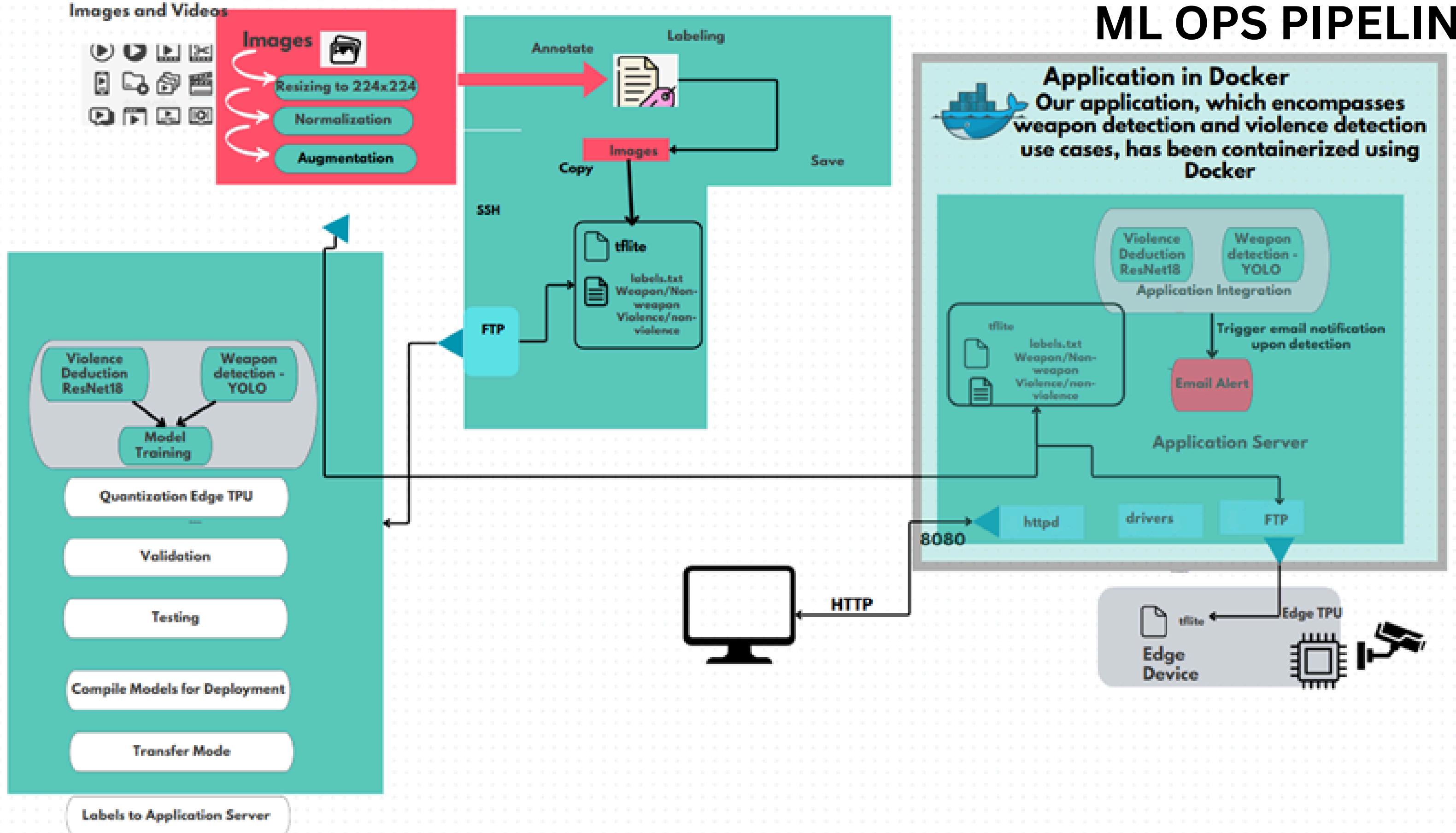
INTEGRATION



WEAPON & VIOLENCE DETECTION - SOA



ML OPS PIPELINE



SafeVision-AI - Register

Username:

Email:

Password:

Register

[Already have an account? Login](#)

SafeVision-AI - Register

Username:

Email:

Password:

Register

Already have an account? [Login](#)

FACE EMOTION DETECTION

Dataset: Labeled images of facial expressions

Model: A Convolutional Neural Network (CNN) trained to recognize 7 emotions:

Angry, Disgusted, Fearful, Happy, Neutral, Sad, Surprised.

Achieved Accuracy: 60.66% on test data.

Real-time detection using OpenCV:

- Detect faces using Haar Cascades.
- Model Architecture:
 - CNN with 12 layers:
 - 3 Convolutional Layers to detect patterns.
 - 3 Pooling Layers to reduce size.
 - Fully connected layers for classification.



Preprocessing:

- Images resized to 48x48 pixels and converted to grayscale.

Real-Time Detection:

- Face Detection:
 - Uses Haar Cascades to locate faces in video frames.
- Emotion Prediction:
 - Cropped face regions are resized and fed into the trained model.
 - Detected emotion displayed with bounding boxes and labels.

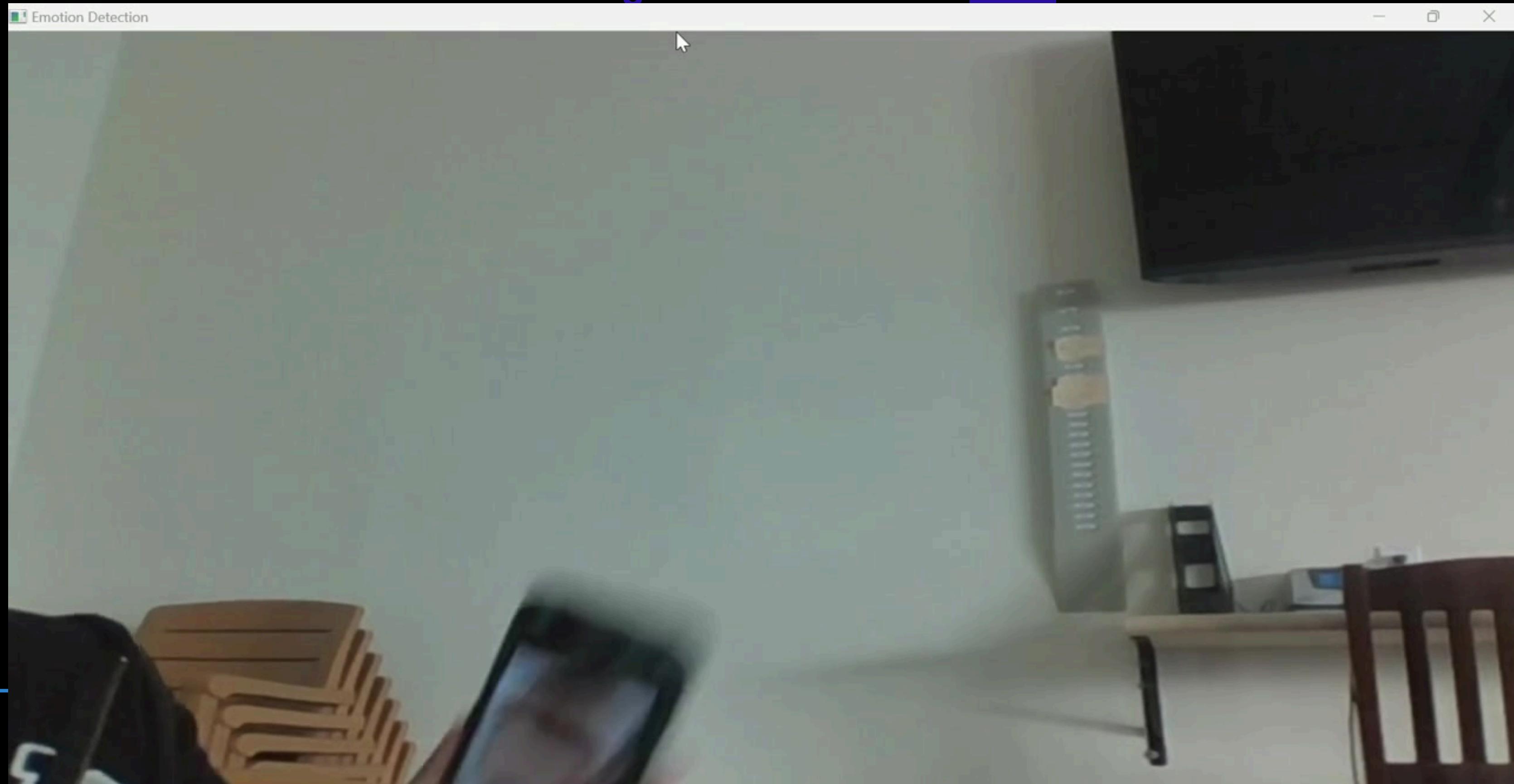
Key Results:

- Accuracy: 60.66%.
- Performance Metrics:
 - High Accuracy: Happy (80%) and Surprised (75%).
 - Challenges: Fearful and Disgusted emotions have lower precision.

Technologies Used:

- Python, TensorFlow/Keras, OpenCV, NumPy, Matplotlib.

FACE EMOTION DETECTION



CONCLUSION

SafeVision-AI is a scalable, efficient, and practical solution for ensuring educational institute safety through advanced AI-based threat detection.

Don't carry a weapon, and don't invite a fight

Be happy and smile
our SafeVision-AI is WATCHING

Thank You