Real-Time Face Recognition System for Remote Employee Tracking

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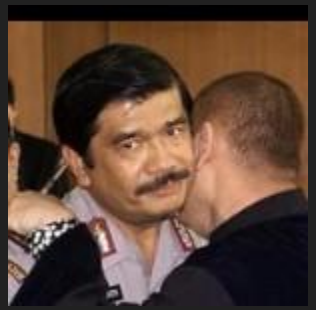
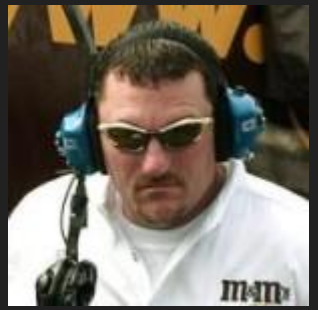
Introduction

During the COVID-19 pandemic, most of the traditional offices converted to remote offices. To maintain the same work efficiency there needs to be a tracking system. We came up with a solution to track the presence of the employees working from home using real-time face recognition system.

Dataset

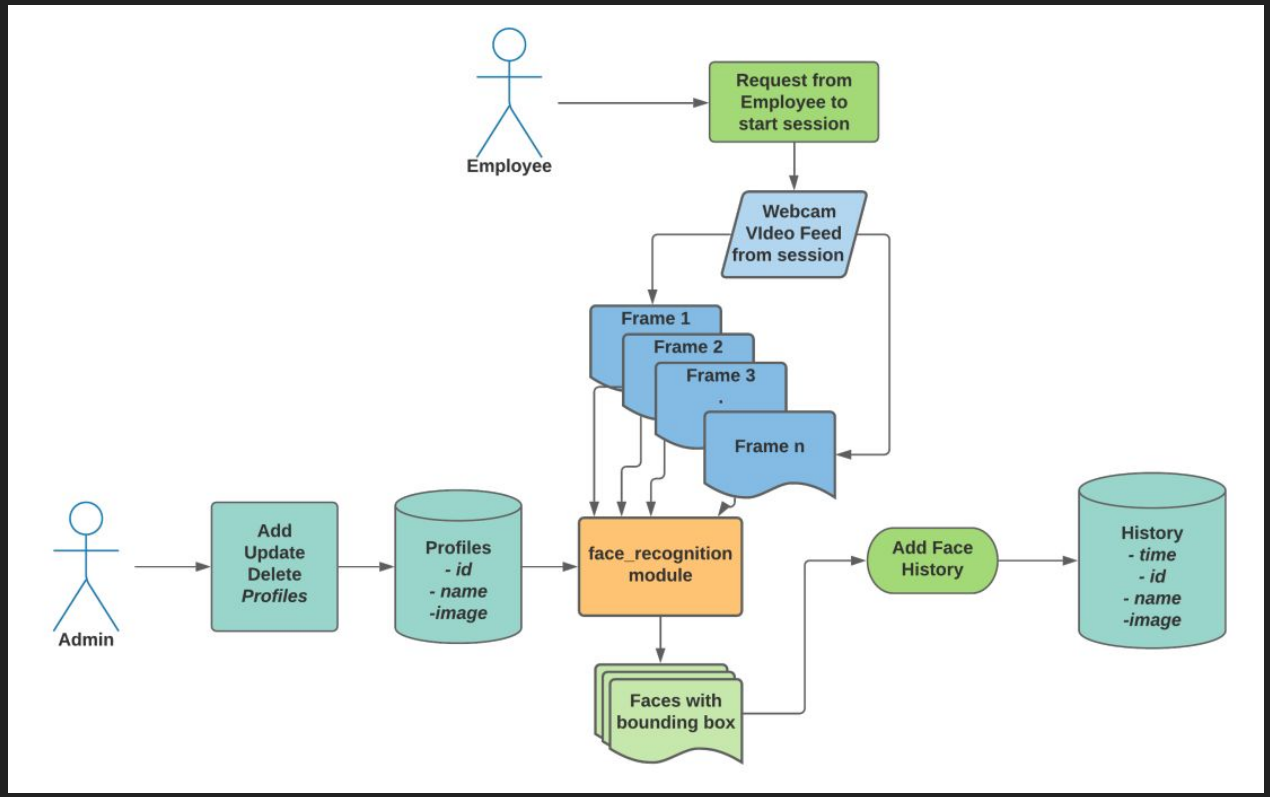
Labeled Faces in the Wild (LFW)

public benchmark for face verification

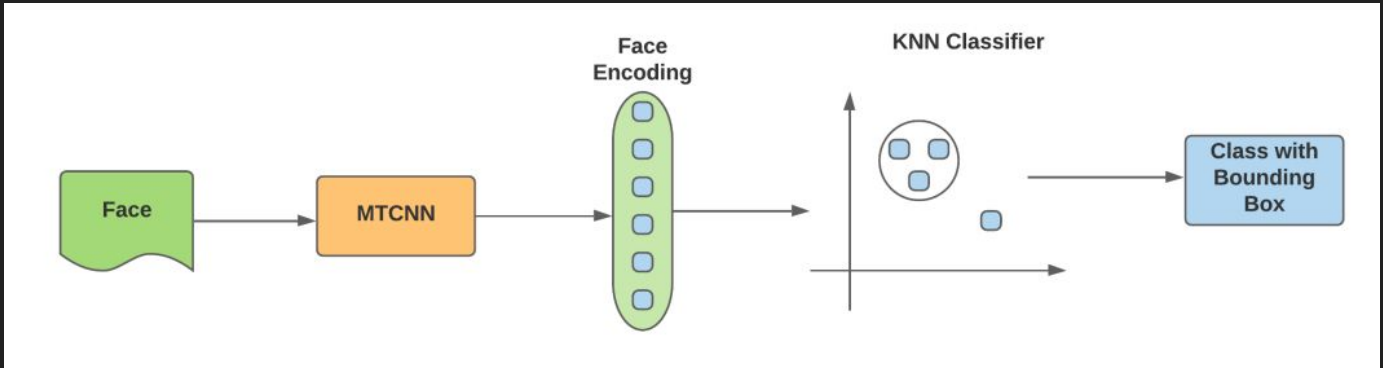






Pipeline


Employee
Request from Employee to start session
Webcam VIdeo Feed from session
Frame 1
Frame 2
Frame 3
.
Frame n
Admin
Add Update Delete Profiles
Profiles - id - name -image
face_recognition module
Add Face History
History - time - id - name -image
Faces with bounding box

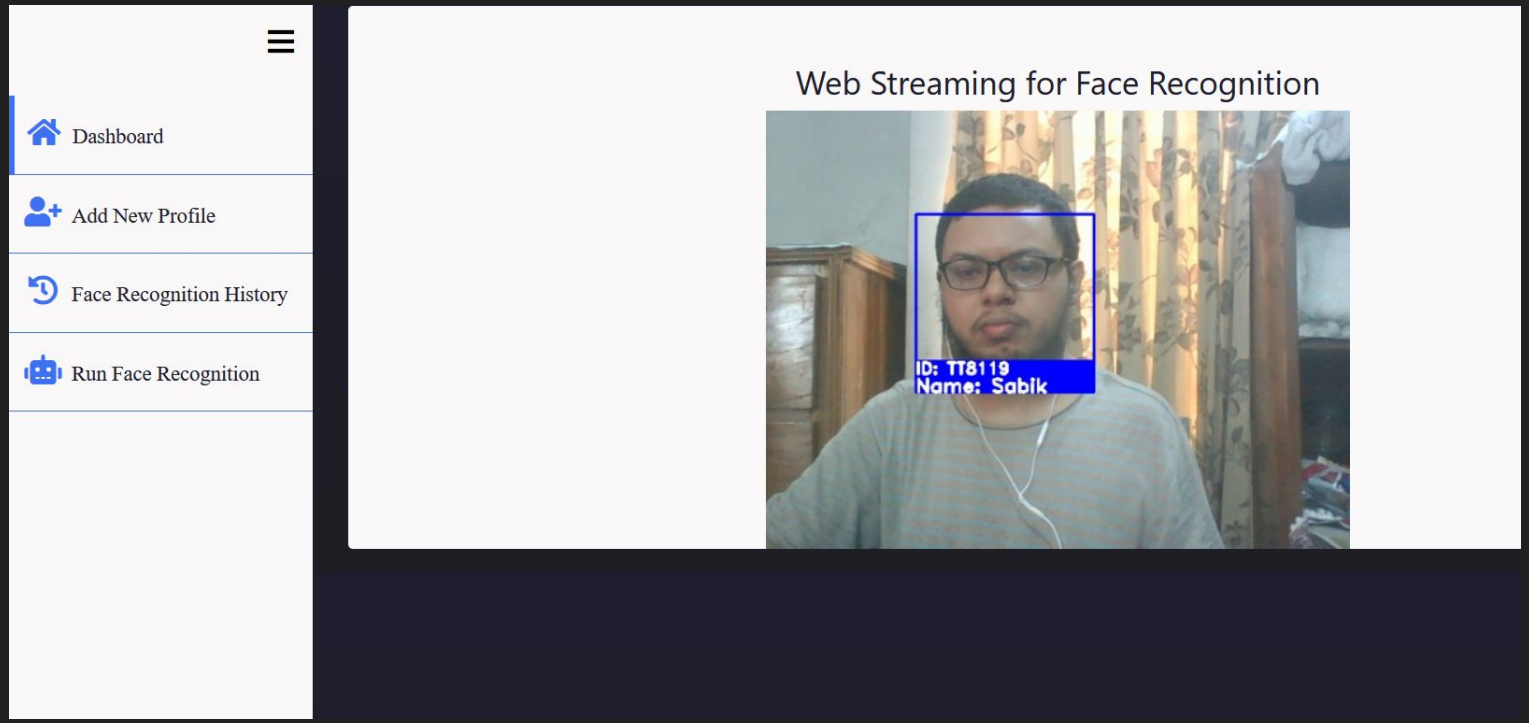
Face Recognition Module



MTCNN => detects the face encodings from faces in an image.

KNN Classifier => finds the most similar faces in the given set.

Working Application



Further Applications

Video Surveillance

Smart Home System

Criminal Identification

Conclusion

Contribution:
We can summarize our contributions as following:
- Achieved State of the Art Performance in LFW dataset
- Real-Time Face Tracking for Remote Employees

Limitations:
Our system is vulnerable to face spoofing attacks. For example:
- Print Attack
- Video Replay Attack
- 3D Mask Attack

Future Plans:
To make our system more robust and less vulnerable to attacks, we are planning to integrate and develop real-time face anti-spoofing methods.