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SCHOOLOF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LOST NO MORE USING AI

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OVERVIEW

- Literature survey
- Problem statement
- Objective
- Introduction
- Proposed system
- Technical specifications
- Methodology
- Conclusion

LITERATURE SURVEY

S.no	Title	Author(s) & Year	Methodology	Remarks
1.	Missing Person Detection System in IoT	Digambar Jadhav et al. 2017	Uses IoT sensors for real-time location tracking and image capture; integrates with local police.	IoT- based approach; lacks direct video analysis capability.
2.	**Finding Missing Person Using Artificial Intelligence**	**A. Ponmalar et al. 2022**	**Uses face recognition algorithms to match uploaded images with those in a database. Notifications are sent if a match is found.**	**Limited to face recognition; requires extensive database.**
3.	IoT Smart Tracking Device for Missing Person Finder	R. Brinda et al. 2022	Utilizes GPS and GSM for real-time tracking; data stored on a web server; multiple user roles for data management.	Relies on GPS/GSM, not focused on video-based searches.

LITERATURE SURVEY Contd...

4.	Identification of Missing Person Using Convolutional Neural Networks	P.D N Harsha Sai et al. 2022	Uses VGG16 CNN for face recognition; preprocesses and augments data for training.	Accuracy dependent on data quality; CNN models can be resource- intensive.
5.	Detection of Missing Persons Using Mobile App	Mohan Datta Inavolu et al. 2023	App interface for entering missing person data; searches using name, age, etc.; includes call and share features.	Not specifically focused on video analysis; depends on user database.

PROBLEM STATEMENT

Finding missing persons is challenging due to the labor-intensive process of manually sifting through extensive CCTV footage, requiring an automated AI-driven system to efficiently analyze video and improve search effectiveness.

OBJECTIVES

- To Develop a web portal to facilitate the entry of missing person details and photos.
- To Convert CCTV videos into frames for detailed analysis by the face recognition model.
- To Implement a deep learning model for face recognition to analyze CCTV footage.
- To Notify relevant authorities and guardians when a match is detected.

INTRODUCTION

- Finding missing persons is a daunting task, often requiring extensive manual review of CCTV footage, which is time-consuming and labor-intensive, especially in busy environments.
- Traditional methods, relying on public notifications and manual searches, can be ineffective in urgent situations.
- To address this challenge, the system proposes an automated solution that integrates a web application with AI for facial recognition.
- It efficiently analyzes video footage, streamlining the search process and increasing the chances of successfully locating missing individuals.

PROPOSED SYSTEM

- The system is designed to provide a user-friendly portal where details and photos of missing individuals can be submitted.
- The system extracts frames from CCTV videos, which are then analyzed using a deep learning face recognition model.
- If a match is detected, the system sends notifications to relevant authorities and guardians, ensuring timely and effective responses.
- Integration of AI and web technologies enhances the efficiency and accuracy of searches while minimizing manual effort.

TECHNICAL SPECIFICATIONS

Module	Specifications
1.Frameworks	**Deep Learning & ML Modules:** Dlib, OpenCV, Haar Cascade Classifier
2. Hardware Specifications	**Processor:** Minimum Intel Core i3, recommended i5 or higher. **RAM:** Minimum 4 GB, recommended 8 GB. **Storage:** Minimum 256 GB SSD, recommended 512 GB SSD or higher. **GPU** (Optional): NVIDIA GPU (CUDA-enabled) for faster training with large datasets.
3. Software specifications	**Library:** OpenCV for reading and extracting frames from CCTV videos **Frame Processing:** Save frames at intervals for analysis **Storage:** Store frames in structured directories for future processing
4. Frontend technologies	HTML5, CSS3, JavaScript
5. Backend Technologies	Python Flask
6. IDE	Thonny

METHODOLOGY

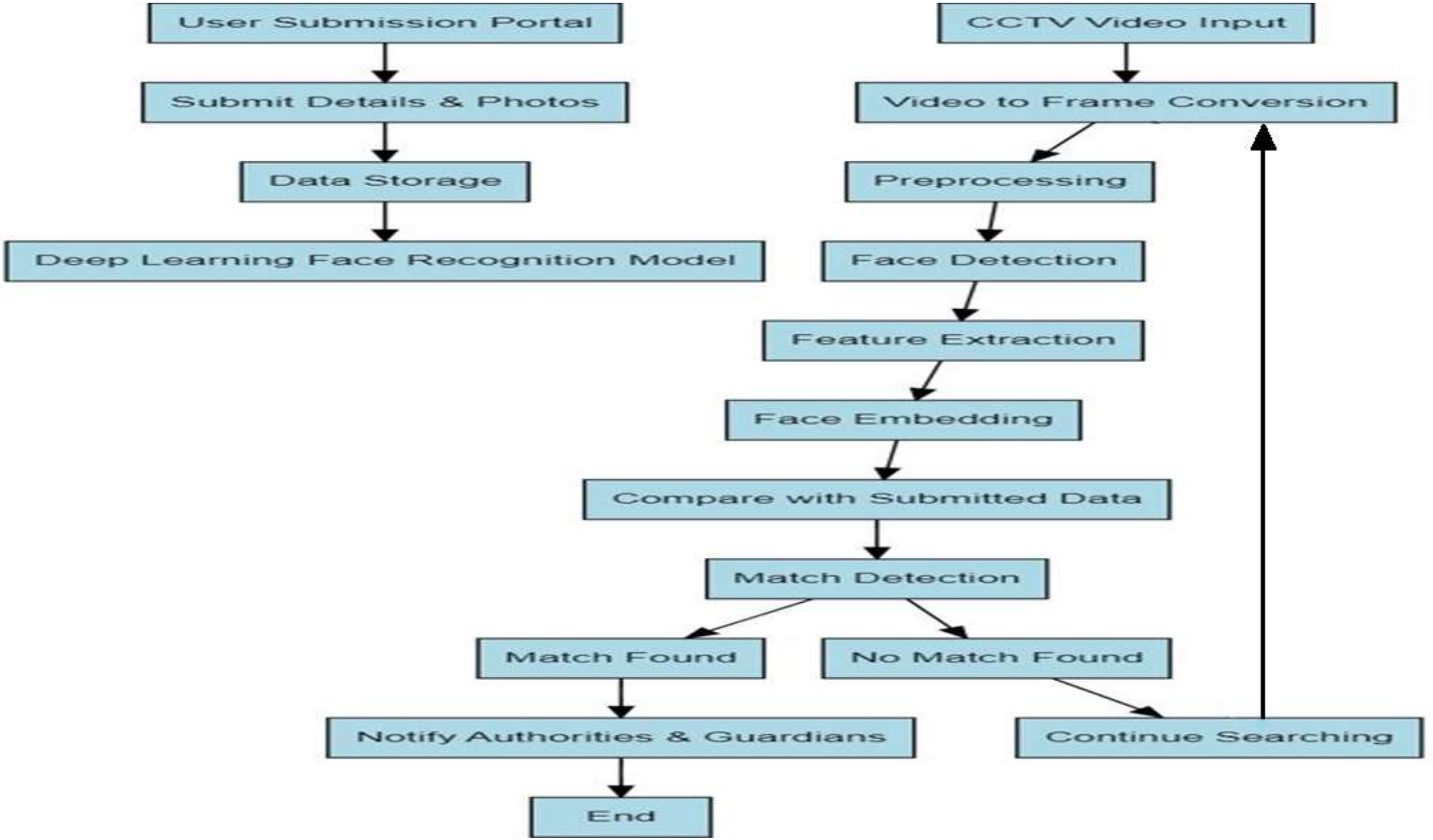
Module 1: Web Portal Development - Create a web portal using Python Flask for users to enter missing person details and photos.

Module 2: Video Frame Extraction - Convert CCTV videos into frames for detailed analysis.

Module 3: Deep Learning Model Implementation- Apply a face recognition deep learning model to the extracted frames.

Module 4: Notification System - Implement a system to notify authorities and guardians upon detecting a match.

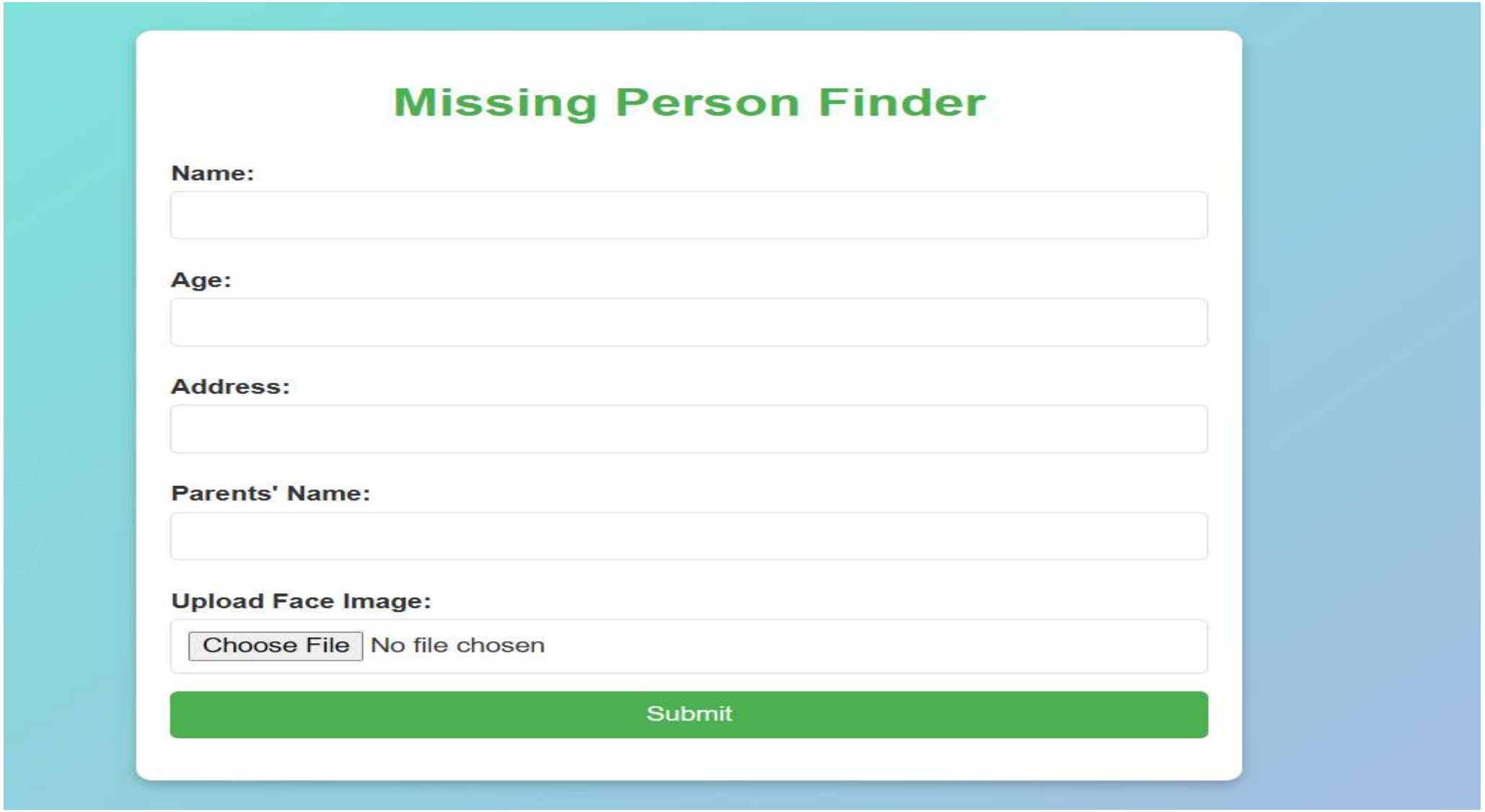
BLOCK DIAGRAM



Module 1: Web Portal Development

- The implementation creates a user-friendly web interface to collect data about missing individuals.
- The portal leverages **HTML and CSS** for structure and styling, ensuring accessibility and responsiveness.
- In this portal, all the details of the missing person are to be filled by the applicant along with their recent photograph.
- The photograph needs to be in **colored format** rather than black and white to ensure higher accuracy.
- **Validation and forms** are used to ensure no information remains incomplete during submission.
- Therefore, this portal helps the user and the officials to easily navigate and also enhances the search efficiency.

Output for Web Portal Development



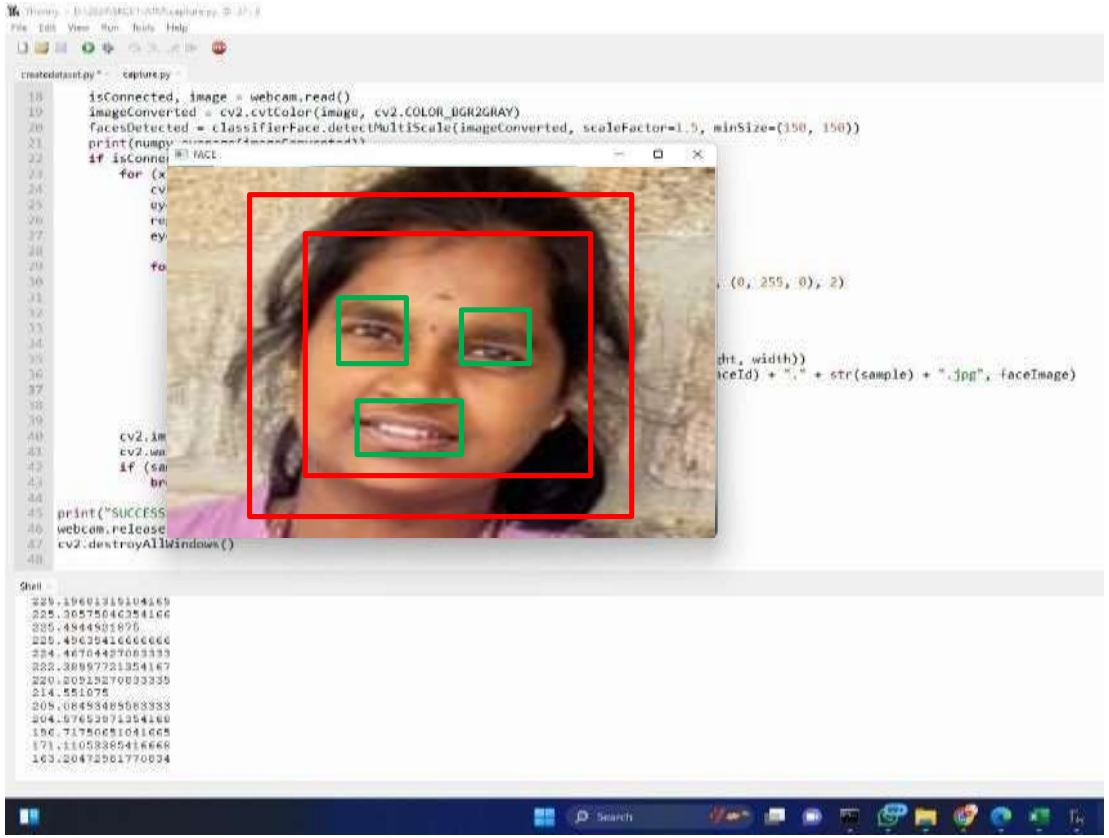
Module 2: Video Frame Extraction

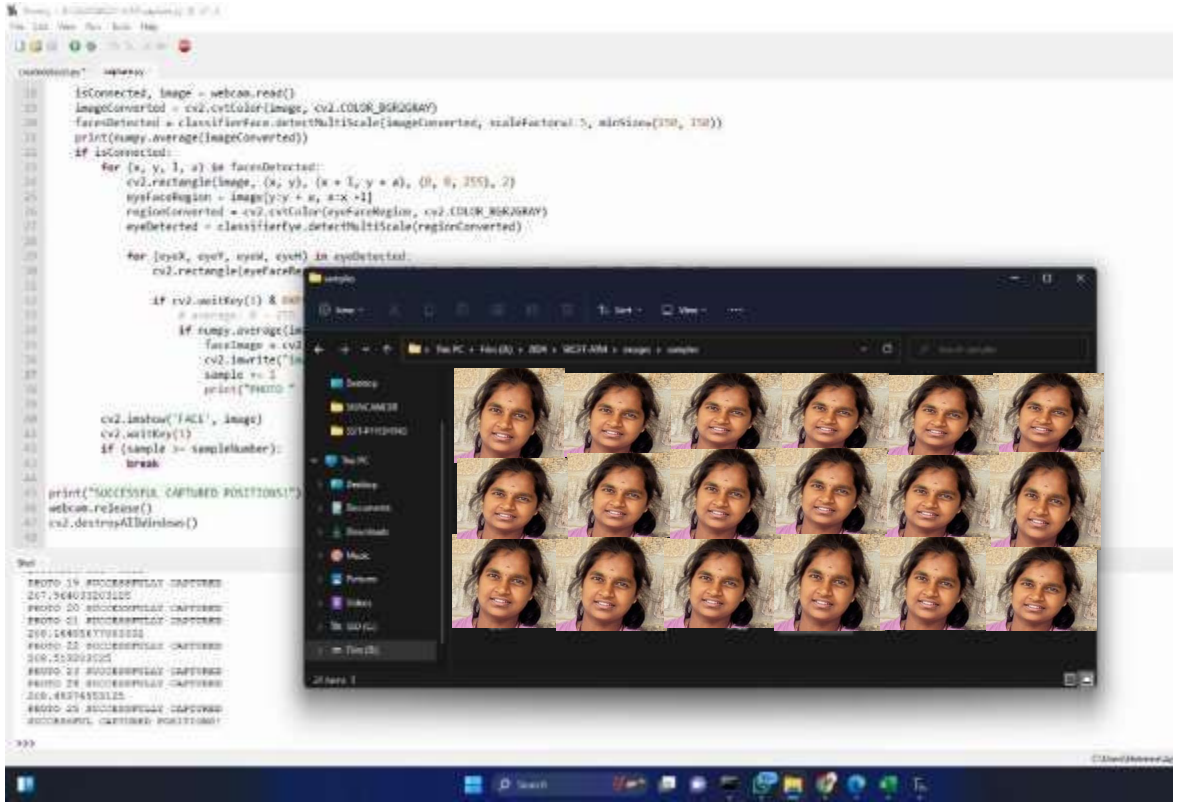
- From the videos facial features are extracted where patterns are learned and these frames are saved as images.
- OpenCV is used to break down the video into individual frames(for one second 72 frames are extracted) and save them locally.
- These frames are resized and converted to RGB for facial detection.
- Convolutional layers break the images pixel by pixel based on the image resolution and patterns learned in each layers and stored.
- For face identification, Haar Cascade Classifier is used, which identifies faces by from various objects present in the videos.
- Haar Cascade classifier identifies human faces and these faces are dragged ,values are separated and stored.

Module 2 Contd..

- Once a face is detected, the dlib library refines the process by identifying 68 facial landmarks, such as the eyes, eyebrows, nose, mouth, and jawline.
- These landmarks help in identifying the persons.
- The frames are saved with highlighted facial features, creating a dataset that can be used for further analysis or model training.
- By combining OpenCV’s image processing with dlib’s advanced facial recognition, the code efficiently detects and analyzes faces in videos for various applications.

Output for converting video to frame





Module 3: Deep Learning Model Implementation

- It utilizes the face_recognition, dlib library and cv2 (OpenCV) libraries to detect and recognize faces in real-time through a webcam.
- Initially, it loads images of missing person("1.jpg") and encodes their facial features (like eyes,nose, edges etc) using dlib library and it is converted into numerical data.
- It has 68- point facial landmark detection which can detect the key points of the face.
- These encoded faces are stored in the known_face_encodings list and associated with names (e.g, "A") in the known_face_names list.

Module 3 Contd..

- A sample video is taken for the cctv video.
- Theses video frames are resized and converted to RGB for face detection.
- It compares these encodings against the known face encodings using compare_faces().
- If a match is found, the name associated with the known face is displayed on the screen, and a red rectangle is drawn around the detected face.
- If no match is found, the system labels the face as "Unknown.“
- By using this method, the system can help identify people in real-time.

Output for facial recognition

Thonny - G:\SECT-OBJECT-PATIENT\face.py @ 26 : 28

File Edit View Run Tools Help

face.py

```
import face_recognition
import cv2
import numpy as np
import serial
import time
from threading import Timer


x = 0
y = 0
z = 0
name = ""
xyu = ""
top = 4
right = 4
bottom = 4
left = 4
image_1 = face_recognition.load_image_file("1.jpg")
image_1_face_encoding = face_recognition.face_encodings(image_1)[0]
image_2 = face_recognition.load_image_file("2.jpg")
image_2_face_encoding = face_recognition.face_encodings(image_2)[0]
known_face_encodings = [
    image_1_face_encoding,
    image_2_face_encoding,
]
known_face_names = ["A", "B"]
face_locations = []
face_encodings = []
face_names = []
video_capture = cv2.VideoCapture(0)  # Use 0 for the default webcam
first_match_index = "9"
```

Shell

```
Unknown
0

1
Unknown
1
Unknown
1
Unknown
1
Unknown
1
Unknown
```

Module 4: Notification System

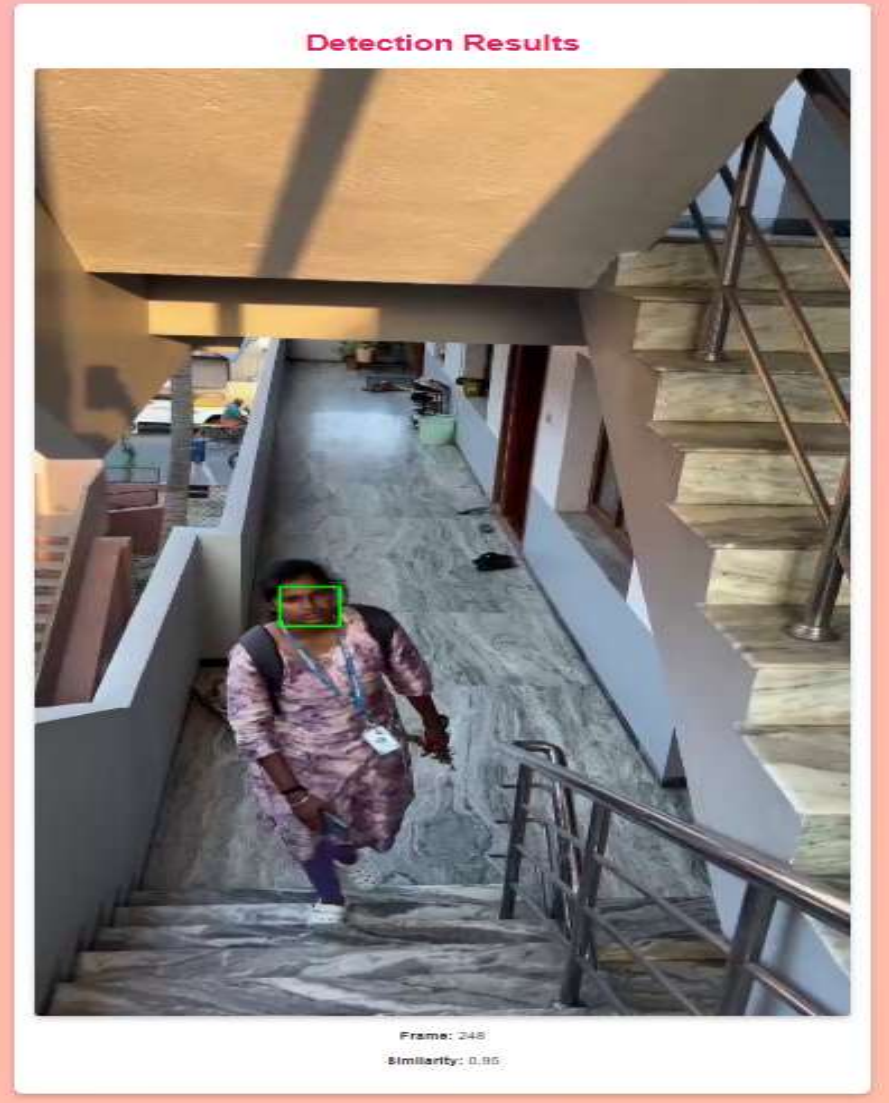
- When a match is found the portal generates a alert.
- Alerts include frame details and location, sent via dashboards.
- These are displayed in the alert

1.Frame Number: Identifies the video frame containing the match.

2.Similarity Score: Confidence level of the match (closer to 1.0 indicates high accuracy).

3.CCTV Frame Visualization: Displays the detected face with bounding boxes for quick verification.

Output:



CONCLUSION

The Missing Person Finder system improves the search for missing individuals by utilizing AI and web technologies. It automates the analysis of CCTV footage through frame extraction and face recognition, greatly reducing search time and effort. The integration of deep learning models enhances the accuracy of identifying individuals in videos. It also streamlines the search process thereby increasing the chances of successful matches, ultimately facilitating quicker resolutions in missing person cases.

FUTURE WORK

Future enhancements include the development of age-invariant face recognition, enabling identification even as individuals age. Additionally, a more advanced notification system could integrate chatbots, SMS, WhatsApp, and email alerts for immediate reporting. These upgrades will turn the system into a real-time, scalable, and highly accurate solution for identifying missing persons, greatly enhancing law enforcement and public safety efforts.

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CERTIFICATES


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DEPARTMENT OF INFORMATION TECHNOLOGY

ASTRANOVA 2K25

CERTIFICATE OF PARTICIPATION

This certificate is awarded to Mr./Ms. Asvika N of Avinashilingam University, for participating in the Paper Presentation event of ASTRANOVA 2K25, a national-level technical symposium held at Coimbatore Institute of Technology on the 28th of February, 2025. The paper was presented on the topic Lost No More Using AI.

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THANK YOU