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Finding Abductors Using AI

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ABSTRACT

This project presents a comprehensive backend system designed to assist in the identification and tracking of missing persons and abductors using deep learning and web technologies. The system leverages a Convolutional Neural Network (CNN) model to perform image recognition on uploaded photographs of missing individuals or suspects, enabling automated matching against a stored database of profiles. The backend is built with Flask and integrates PostgreSQL for robust data storage, including user details, case reports, and image records. Authentication mechanisms secure access for general users, victim families, and authorized police personnel. The system supports image uploads, real-time prediction, and retrieval of matched records, enhancing law enforcement's ability to verify cases quickly and accurately. This solution aims to streamline the investigative process, improve data management, and facilitate collaboration between affected families and police authorities.

1-INTRODUCTION

In this huge world, everyday lot of people goes missing either it may be kids, teens, old aged people or people with alzheimer's etc. Lot of people will be left untraced due to various number of reasons. This project helps the police personnel and other authorities to find out the missing person identity using advanced technology that includes deep learning algorithms and artificial intelligence. Usually face recognition is used in variety of domains that may include smart technologies like smart phones or smart watches, social media and its applications, advertising etc, but identifying a missing person using this technique is the most beautiful use of face recognition. In, this project we actually create a portal which is accessible to the common people and the police authorities. In this portal, the images of the missing people are uploaded by the victim's family and the common people uploads the suspicious images of the lost people along with the location that they see in their daily running life's. The images that match together are thoroughly checked by the police and find the missing persons in that particular location. The matching of the victim's image and the images uploaded by the common people is done by using CNN algorithm, which helps in classifying the characteristics of the images uploaded by the common people like skin tone, gender, iris color etc. By doing this, we can classify all the images uploaded into the portal and classify them and then match the images accordingly. In this system we have created an application that stores all the details regarding the missing persons into the database. If the common people uploads the images of the suspicious missing people, that details are also stored into the database along with the added location. All these processes might require effort at the time of creation but at the end all of these will be very worthy. In order to avoid the ambiguity, we also we upload a set of images to the database which acts as a base, it helps the application train through a process that is known as anchoring.

Existing system

We actually did a lot of literature survey and summed up lot of details from lot of papers. Firstly, our major breakthrough was after reading the paper submitted by S.AYYAPPAN and his students from IFET college of engineering. This paper deals with the same kind of problem statement as our system. This system proposed by them uses Deep learning techniques which are based on facial feature extraction. These images are stored in the database and are trained using CNN. Then these images are used to label the missing person correctly after classification. The main difference between our project and their project is that, we create a portal and give access to both the common people and the victim's family along with the police authorities acting as administrator. Their system involves hard-coded algorithms that make the execution slower.

Proposed System

In our proposed system, the process begins when a missing person's family registers a case on the portal, uploading images and necessary details. This information is stored in a database. Common people can also upload images of unidentified individuals along with location details.The system processes these images using a CNN algorithm, which extracts features and classifies them for accurate matching. AI then analyzes patterns and pushes the most probable matches above a threshold confidence level. Police authorities verify these matches through in-person checks and take necessary action.This approach improves the accuracy and efficiency of missing person identification, assisting both law enforcement and affected families.

2. REQUIREMENTS ANALYSIS

Functional requirements

System Module:

- Web Portal Creation
- Creating the Database
- Adding Base Cases
- Training the Model
- Testing the Model
- Predicting using the Model

User Module(Victim's family and common people):

- Registering New Case
- Login
- Uploading all details and images
- Pushing to Portal
- Logout.

Non-functional requirements

- Performance
- Scalability
- Availability & Reliability
- Security
- Usability & User Experience
- Compatibility
- Legal & Ethical Compliance
- Maintainability & Modularity

Hardware resources

Processor: Apple Silicon Chip M2

RAM: 16 GB

Operating System: Mac

Software resources

- Frontend: HTML, CSS, JavaScript
- Backend Framework: Flask
- Database: PostgreSQL
- Operating System: Windows, Linux, macOS
- Platform: Web-based

3.DESIGN

Project architecture represents number of components we are using as a part of our project and the flow of request processing i.e . what components in processing the request and in which order. An architecture description is a formal description and representation of a system organize d in a way that

supports reasoning about the structure of the system

. Architecture is of two types. They are :

Software Architecture

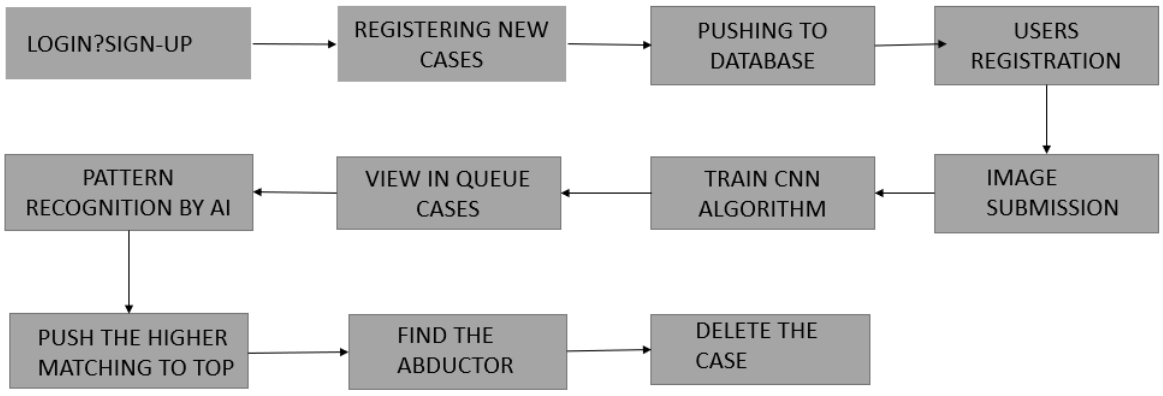

Fig 3.1.1 Software Architecture

3.1.2 Technical Architecture

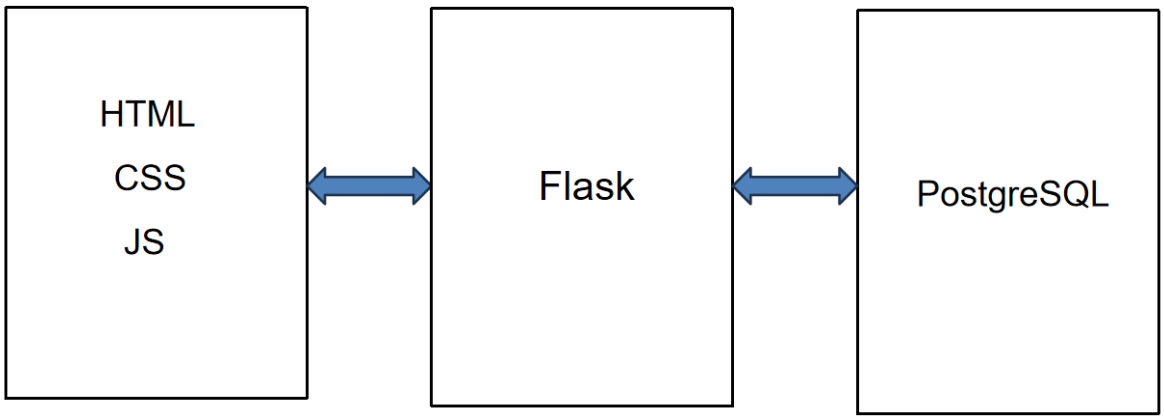

Fig 3.1.2 Technical architecture

4.IMPLEMENTATION

The implementation of the abductor detection system involves a combination of advanced technologies in artificial intelligence, web development, and data management to create a robust and efficient backend service.

Python

Python serves as the primary programming language due to its versatility and the extensive availability of libraries suited for machine learning, image processing, and web development. It allows seamless integration between different components of the system.

Flask

Flask, a lightweight and flexible Python web framework, is used to build the backend RESTful API server. Flask handles HTTP requests and responses, manages routing, and facilitates communication between the frontend user interface and the backend services. It is responsible for authenticating users (including police officers and

common users), handling image uploads, triggering prediction tasks, and serving data to clients**.**

TensorFlow / Keras

At the core of the system's image recognition capability lies a Convolutional Neural Network (CNN) model built and trained using TensorFlow and Keras. This deep learning model is specifically designed to analyze facial features from images of missing persons and abductors, learning complex patterns to accurately identify individuals even under varying image conditions such as lighting, angle, and resolution.

OpenCV

Prior to passing images to the CNN, OpenCV is employed for preprocessing tasks. OpenCV helps in standardizing image sizes, enhancing facial features, converting images to grayscale or other formats, and performing face detection. This preprocessing ensures that the input to the CNN model is optimized for better prediction accuracy.

PostgreSQL

Data storage and management are handled by PostgreSQL, a robust open-source relational database system. PostgreSQL stores user credentials, missing persons details, abductors' records, and image metadata. The relational model ensures efficient querying and secure storage of sensitive data.

JWT (JSON Web Tokens)

For secure and stateless user authentication, the system uses JSON Web Tokens (JWT). JWT allows users to authenticate with their credentials once and then pass a token with each subsequent request, which the backend verifies. This method improves security and scalability, especially for police personnel who need reliable access controls.

Docker (optional, if used)

The project optionally uses Docker containers to package the backend environment, dependencies, and configurations. Docker enables easy deployment across different machines and simplifies environment setup, reducing inconsistencies between development and production.

HTML, CSS, JavaScript (for frontend)

On the frontend side, the system leverages standard web technologies such as HTML, CSS, and JavaScript to create a responsive user interface. This interface enables families of missing persons, police authorities, and general users to upload images, view prediction results, and interact with the database seamlessly.

Together, these technologies create an integrated ecosystem where image data flows securely from users through preprocessing and deep learning models to backend APIs and databases, enabling efficient identification and tracking of missing persons and abductors.

Pseudo Code

Backend (Flask, PostgreSQL, CNN using TensorFlow)

5-SCREENSHOTS

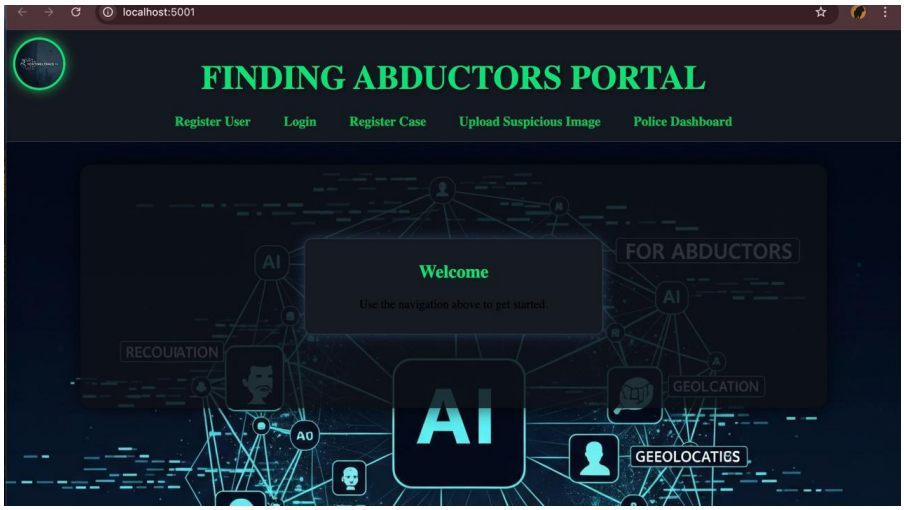

Fig 1 web site

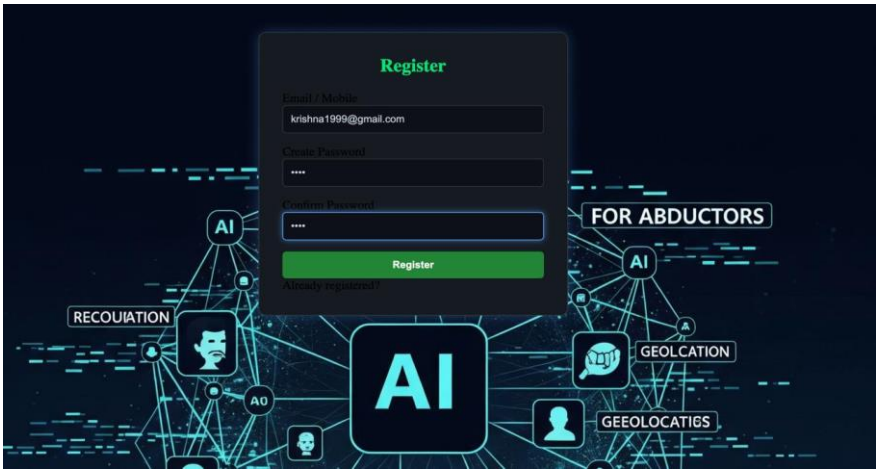

Fig 2 Registration Page

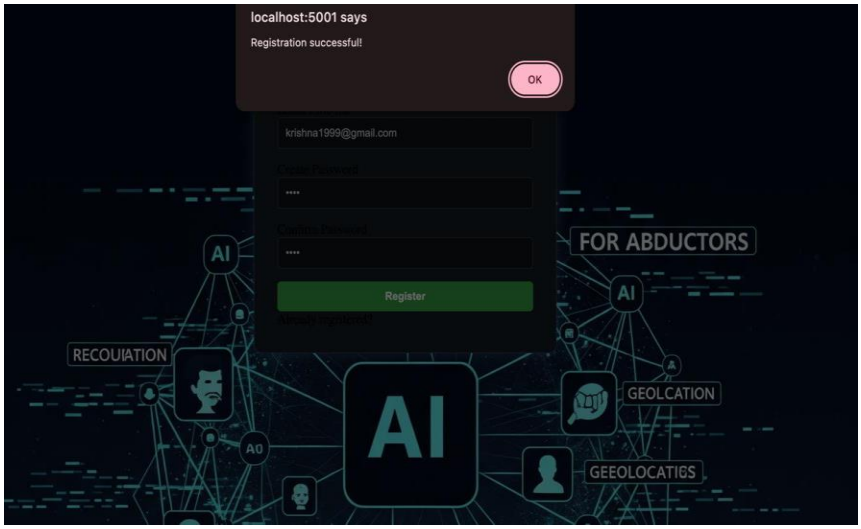

Fig 3 Registration Successfull

Fig 4 Login page

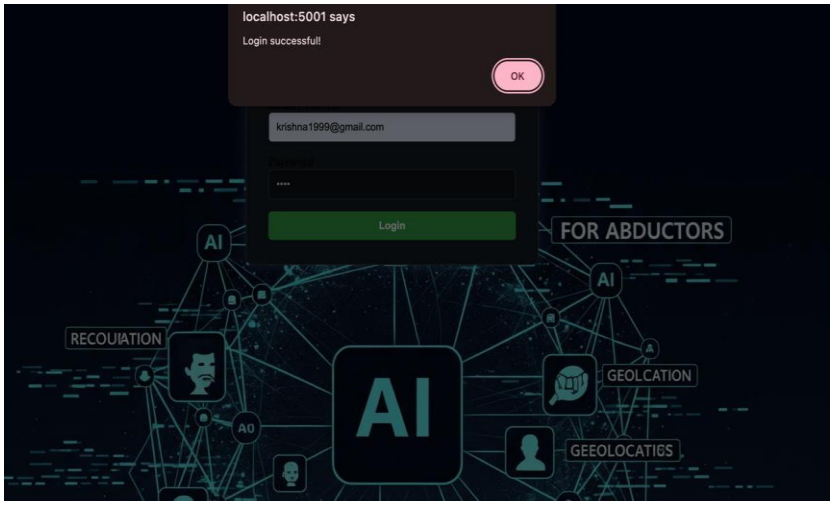

Fig 5 Login Successfull

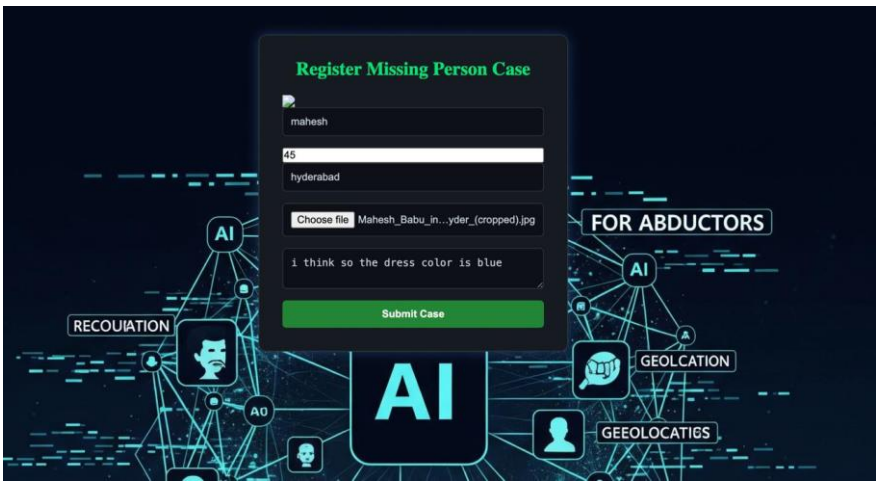

Fig 6 Register Missing Person Case

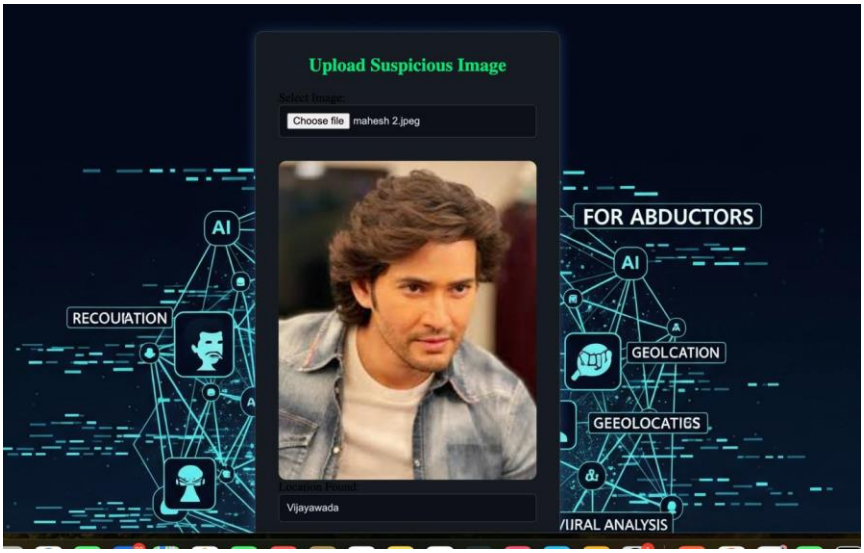

Fig 7 Upload Suspicious Person Image

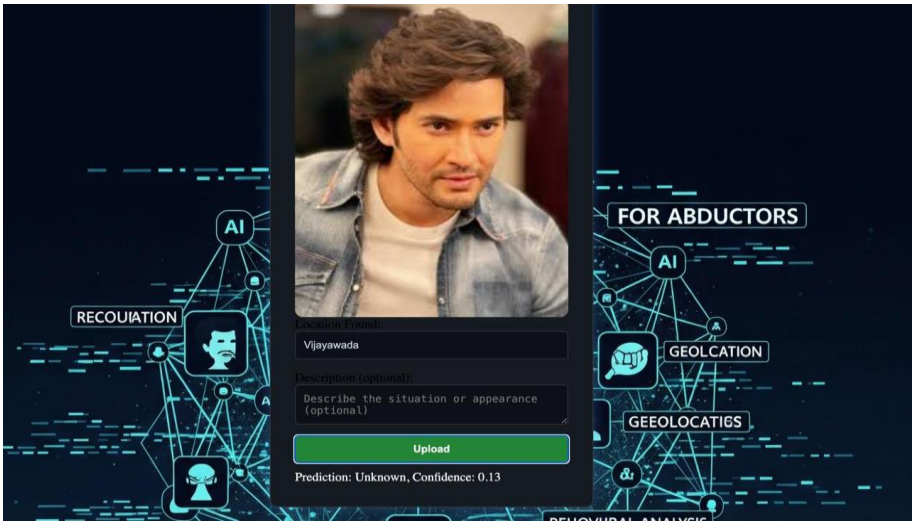

Fig 8 Prediction

6-CONCLUSION

The Missing Persons and Abductor Detection System integrates deep learning with web technologies to assist in the swift identification of missing individuals and potential abductors. By using a Convolutional Neural Network (CNN) for facial recognition, along with Flask for backend services and PostgreSQL for secure data storage, the system offers an effective platform for police authorities and the public to collaborate in real-time.

This project demonstrates how AI and image processing can significantly improve the speed and accuracy of identifying individuals in critical situations. It allows common users to report missing persons by uploading images, and enables police officials to verify, track, and respond to such cases through a centralized dashboard.

The use of JWT-based authentication ensures secure access to sensitive information, while the modular

architecture allows scalability and integration with other public safety systems in the future.

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