



AI BASED MISSING PERSON SEARCH SYSTEM

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Abstract

Countless people disappear every day, including children, teenagers, the mentally retarded, children with autism, and the elderly with Alzheimer's disease, and many of them are still missing. According to the latest data from the National Crime Records Bureau (NCRB), 59,262 children went missing in India in 2020. If someone goes missing, police can send a photo of that person to keep on file. Whenever anyone comes across a complaint, they can take a photo of that person and upload it to our portal. The face recognition model in our system uses face coding to try to find matches in the data. Facial encoding of uploaded images is done by comparing them to the facial encoding of images in the database. If a match is found, police will be notified. The app keeps a record of all missing people, and when a match is found, the relevant authorities in the area are notified. In addition to photos, police can also find the user's location at the time the video was recorded useful. Children, runaway teenagers, mentally ill people, Alzheimer's patients, criminals, etc. are also classified. Information about all missing persons is also classified. People disappeared. We can provide information about this gift through our application. Where permitted, we may also integrate our information with the government's Aadhar database, which contains biometric information available in our systems. Many mobile phones today are equipped with fingerprint sensors, allowing fingerprint matching. In addition to all the features mentioned above, we are planning to create a child labor section where users can upload images of any child labor practices they may be involved in, and then notify the authorities about these practices so they can take action.

Keywords: Missing, children, criminals, police, search, face recognition.

Introduction

Recognizing faces is natural for us humans. "Facial recognition" is a common problem, we recognize the person but cannot remember their name. The ability to recognize faces is so important to humans that there is an area of the brain dedicated to this task. But like most people, there is a limit to the number of faces our brain can store or how long we can remember them. This is the logic of Woody Bledsoe, Helen Chan Wolf, and Charles Bisson, early leaders in the field of computer facial recognition. Most of his research was unpublished at that time (1964-65), but later his early studies were published on eyes, mouth, etc. It was discovered that it involved marking various "landmarks" of the face, such as: Used in many of today's Advanced facial recognition algorithms.

In simple terms facial recognition works in three stages:

Detection:

Detection is the process of finding faces in an image. In most cases, it is not possible to obtain an



individual's full passport (usually a full-body or group photo). So the first thing you need to do is determine where your face is in the photo.

Analysis (Feature Extraction):

The facial recognition system then identifies the facial image. Compare and read facial geometry and expressions. We know the face (features), which are the key to distinguishing a face from other objects. When recognizing faces, the following features are generally considered: -

- Distance from the eyes
- Distance from the forehead to the chin
- Distance from the nose and mouth
- Depth of the eye sockets
- Shape of the cheekbones
- Lips, ears and jaw line

Recognition:

The final step, facial recognition, can identify a person by comparing faces in two or more images and assessing the likelihood of a match. It can be used at any time or many files (parallel processing) etc. You can do. Photographs of complainants can be uploaded to check whether they have been reported missing. Uploaded images are compared with images in the warehouse using a visual-based visual comparison system, and if a match is found, stakeholders are informed.

Literature

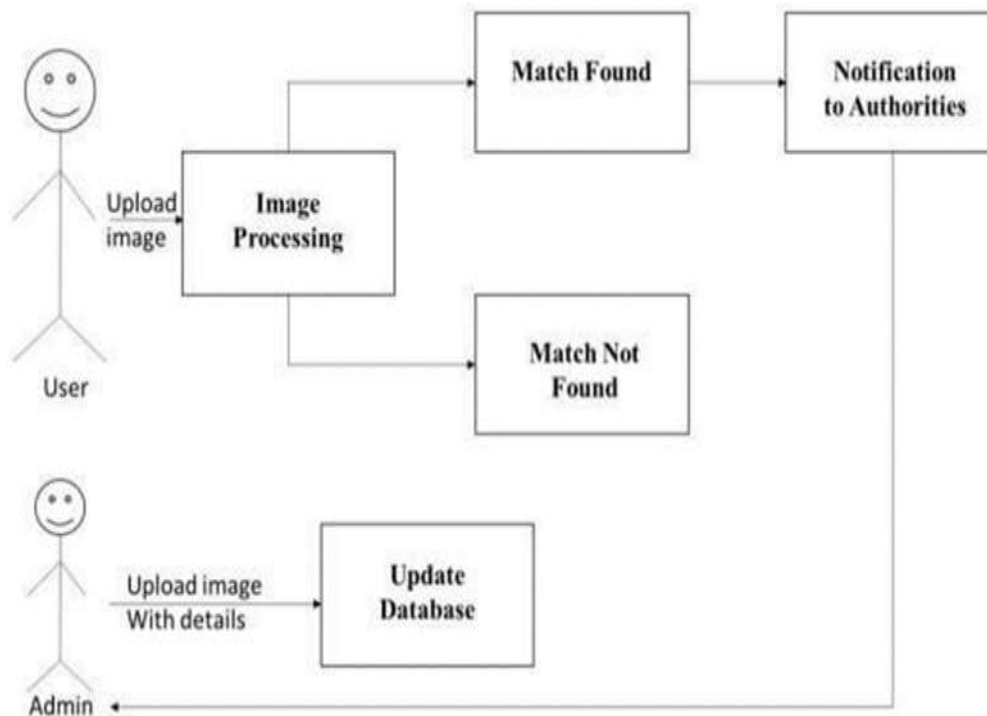
1. This article explains the use of DNN and other methods (such as Adrian method, FaceNet method) for face recognition. It also shows some examples of his work created by Satya Mallick and Adrian Roseback. The author also offers some tips on how to integrate the above techniques into your application through Esteban Uri, "**Real-Time Facial Recognition with Android + TensorFlowLite**".
2. Provides automatic face detection and recognition for surveillance purposes. This method first detects skin in an image using the askincolor model using YCbCr and HSV color spaces. The aspect ratio is then used based on face recognition. Finally, we use the PCA CV verification algorithm to accurately identify faces. Arya, Abhinav Adarsh, "**Effective Facial Detection and Recognition Approaches for Surveillance**" - 2015 International Conference on Intelligence and Communications.
3. This paper evaluates the performance of face detection system in video archives. The video archive includes pre-production information as well as homemade information. This function shows the percentage of face detection in different video formats. Tests were made on .3gp, .avi, .mov, .mp4, and ready-made files were in .wmv, .m4v, .asf, .mpg file formats. Pranti Dutta, Nachamai M, "**Face detection from video files of different formats**".
4. Based on the theory proposed by Yang, combined with skin color segmentation and edge detection, the paper proposes a system to accurately detect the facial area and improve the real-time accuracy and reliability of face detection in fatigued situations. driving alert. We combine the Gaussian model and the elliptical clustering model, He Guohui, Wang Wanying, "**A Face Detection and Positioning Algorithm for Fatigue Driving**" - 2015 8th International Conference on Intelligent Computing Technology and Positioning Automation.

Aim & Objectives

1. Assist law enforcement agencies in the search of missing individuals and criminals.
2. Use AI face-recognition techniques to identify missing/wanted individuals.
3. Utilize mobile phones of every citizen.
4. Equip citizens with a tool using which they can help the police.
5. Decrease the number of missing individuals.

6. Decrease the crime rate and ultimately help the Government in the Fight Against Crime.

System Architecture



Application

The Missing Person Search system can be used in following areas:

1. Law-Enforcement agencies: To enlist public help in searching missing individuals.
2. General Population: To capture images and help police in the search.

Libraries & Services Used

- [1] **Ngrok** :- Ngrok is a cross-platform software tool that allows developers to build security between local computers and the public Internet. It exposes the local website to the internet, allowing external users to access it. It is mainly used for testing and debugging web applications or APIs, as well as for presentation and collaboration. Ngrok allows developers to test their applications in real-world scenarios without the hassle of deploying applications to public servers. The connection is established via http 5000 port.
- [2] **Flutter** :- Flutter is an open source mobile application development program developed by Google. It allows developers to create high-performance, native applications for mobile, web and desktop platforms from a single source code. Flutter uses the Dart programming language, also developed by Google, and offers a rich set of presets and tools that make it easy to create beautiful, fast and responsive user interfaces.
- [3] **Twilio** :- Twilio is a cloud communications platform that provides developers with APIs (application programming interfaces) to create SMS, voice and video messaging applications. Twilio's API allows developers to integrate communications capabilities into software applications without creating complex communications. Customer support, appointment reminders, marketing campaigns, etc. Create solutions for customers such as. Twilio is a leader in the CPaaS (Communications Platform as a Service) market and its innovative solutions are recognized by Forbes, Gartner and other industry analysts. Find a good match for the picture.
- [4] **Yagmail** :- Yagmail is a Python library that makes it easy to send emails from Python scripts. With Yagmail, developers can send emails using a Gmail account or other SMTP server with



minimal configuration. Yagmail provides a simple and intuitive API that allows developers to send emails with just a few lines of code.

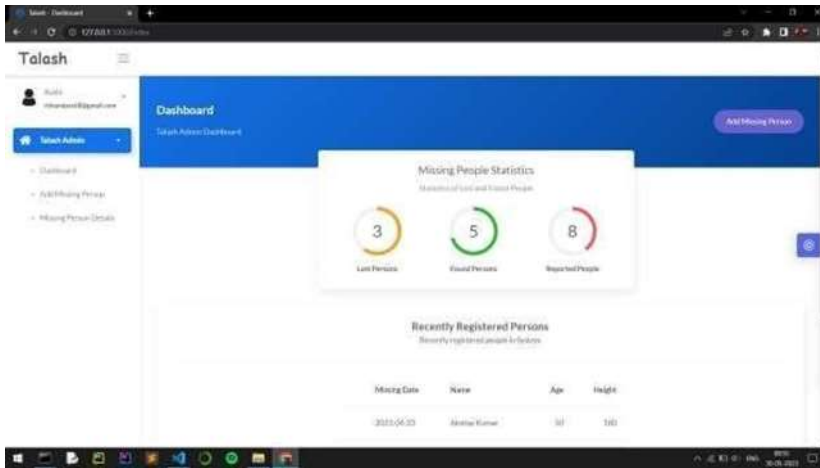
- [5] **Flask :-** Flask is a lightweight Python open-source web framework that allows developers to quickly build web applications. In this application, Flask is widely used to create a web-based admin portal for the application.
- [6] **SQLite :** SQLite is a simple open source relational database management system. SQLite is a serverless database, meaning it does not need a separate server program to run. Alternatively, it stores all data as a single file on the local disk. This makes it easy to install and maintain and is very portable.

Results

Administrator/Server Portal:

The data will be managed by the administrator who has access to the user interface and image processing will be done there. The system management user interface is shown below:

Admin Dashboard:



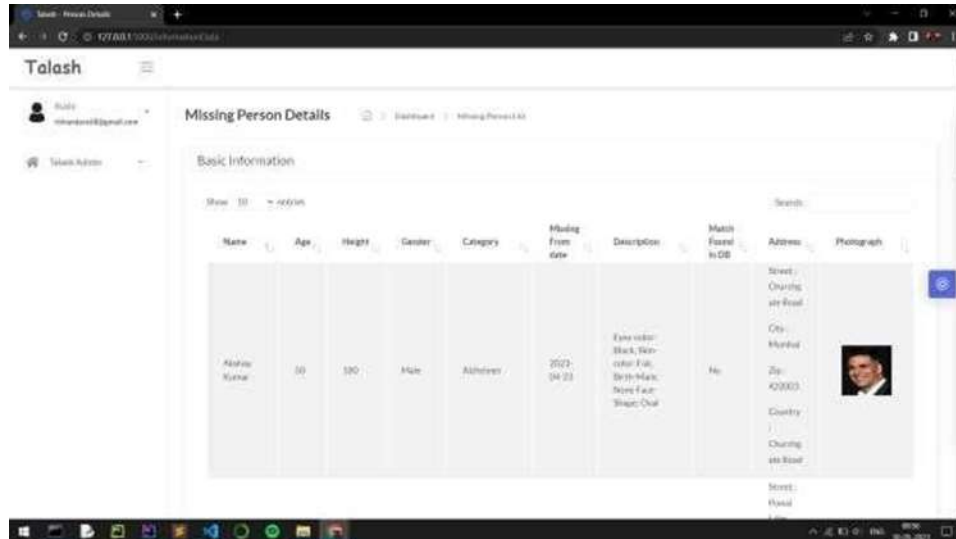
The admin dashboard is the home page of the portal and contains missing person statistics, a brief summary of information content, and a side navigation bar.

Page to input new missing person:



This page contains a form that must be filled out to register a new missing person. Name, email address, mobile phone number, age, gender, missing information, height, address, photo, description, etc. Details like.

Missing Person Details:

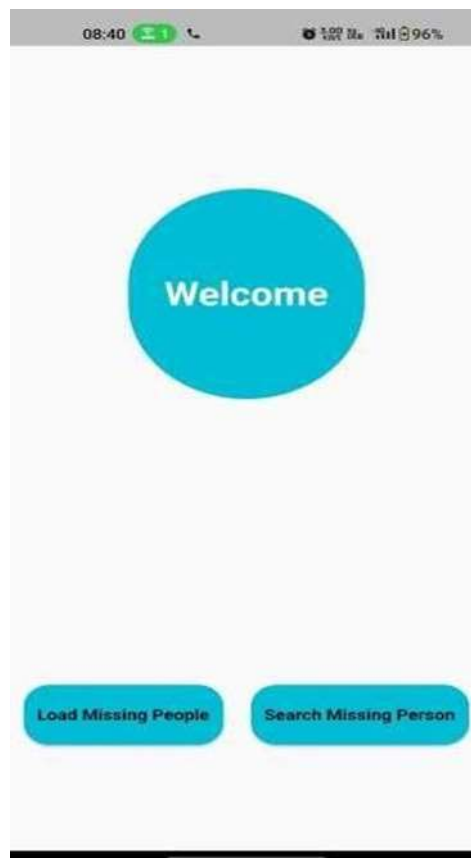


This page contains the full overview of the database in the table form.

Mobile Application:

The mobile app was kept as simple as possible to ensure the app was still usable. The mobile application interface of the system is shown below:

Home Page:

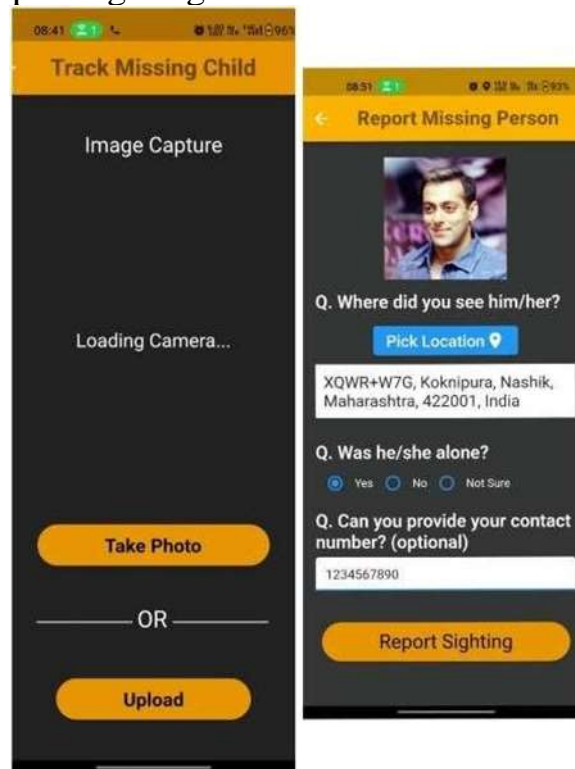




Missing Person Details:



The Missing Person Database can be seen in the form of cards as shown above. Capture Image and ReportSighting:



On the two pages mentioned above, users can take or send a picture from their device and then publish the view by entering details such as location, mobile phone and more.



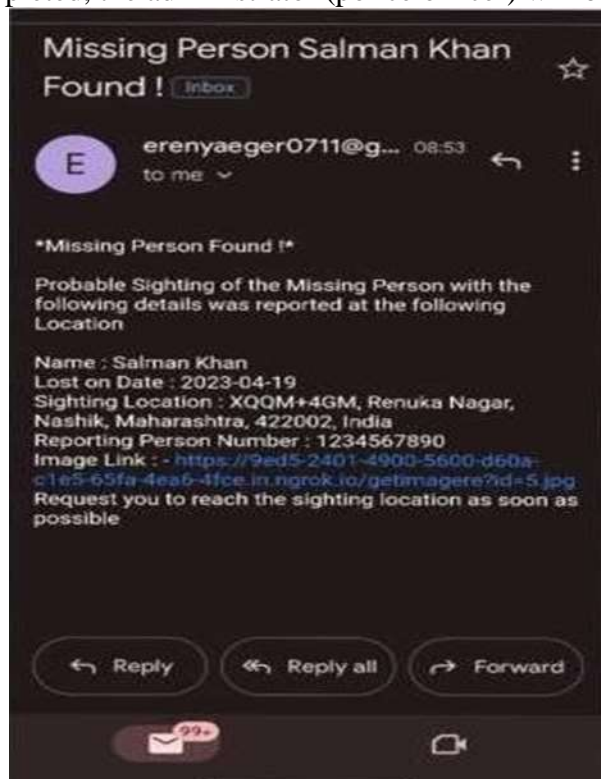
Match Found and Missing Person Details:



After a successful match is found, the user is notified by the above two pages.

Email Notification:

When the matching is completed, the administrator (police officer) will be notified via email.



System Requirements

Hardware Requirements:

- AMD/Intel i3 Processor or above Processor
- 8GB RAM or above RAM
- 80 GB or above Hard Disk



- Graphics Card: NVIDIA G4 or above
- A mobile device to test the mobile application

Software Requirements:

- Windows 8.1 or above
- HTML
- JavaScript
- Java
- Flutter
- Android Studio
- Android Emulator for testing

Conclusion

Our goal is to implement our application using the gradient-driven histogram algorithm, using the opencv/Dlib library for facial recognition, using RabbitMQ messaging for notifications, using the LocationListener library to retrieve geolocation information such as latitude and longitude, as well as the core functions of our system.

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