AADHAR ENABLED BIOMETRIC PORTAL FOR MISSING IDENTITIES

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Abstract - In India a countless number of children are reported missing every year. Among the missing child cases a large percentage of children remain untraced. Face recognition is a biometric-based technology that maps an individual's facial features mathematically and stores the data as a face print. It employs Machine Learning on the image and generates a feature vector that maps an object with an array of numbers. The main idea of this work is to identify the reported missing child from the Aadhar database, extract his/her details and notify the respective authorities. The police authorities can upload photographs of a suspicious child who does not know proper/adequate information about their address/parents. The photo will be automatically compared with the Aadhar dataset repository. Classification of the input child image is performed and photo with best match will be selected. The Aadhar enabled data of missing person like photo, age, address, finger prints may be circulated to all state and district level police authorities through the dedicated portal with limited access to the authorized authorities only. This would help the Police authorities to find the missing children in their localities with authenticated and integrated information system.
 Compared with normal deep learning applications, our algorithm uses convolution network only as a high-level feature extractor and the child recognition is done by the trained KNN classifier. This system will reduce human trafficking issues and ensure the security in our society. It will link the authorities making their process simpler and fast. The analysis and implementation result shows that the project is feasible and implementation is highly recommended by the researchers.s.

Key words: MTCNN, Keras, Matplotlib, face recognition, Aadhar Biometrics.

1. INTRODUCTION

As we know that India is a second largest country in the world if it comes to population. And there are many children among us. As there is a great saying "TODAYS CHILDREN ARE TOMORROWS CITIZENS". So as a citizen of India it is our responsibility to save our children's from Kidnappings or Missing. There are many situations in which we see a child who is lost in one state may be found in another state. And also consider a case like a child is too young to speak or remember his/her address or not able to identify his/her parents. It takes more time to find that child if the case was like the one mentioned above. So we have implemented a Missing entity identification algorithm which takes faces and fingerprints into account. Portal linked with Aadhaar biometric information system may be conceptualized for integration of information. Through this, the police authorities can upload photographs of

suspicious child who do not know their proper address. The photo will be automatically compared with the Aadhar dataset repository. It would return the valid details of the child and notify the respective authority under whose area the child belongs. This information may be used by the designated authorities for the search of the missing persons in locality under their jurisdiction.

2. BACKGROUND

A) MOTIVATION

We are developing a portal that is linked with Aadhar biometric information system. The Aadhar enabled data of missing person like photo, age, figure prints may be circulated to all state and district level police authorities through the dedicated portal with limited access to the authorized individuals only. This information may be used by the designated authorities for the search of the missing persons in locality under their jurisdiction. This would help the Police authorities to find the missing person in their localities with authenticated and integrated information system. Earliest methods for face recognition commonly used computer vision features such as HOG, LBP, SIFT, or SURF. However, features extracted using a CNN network for getting facial representations gives better performance in face recognition than handcrafted features. After that, we would be considering the other biometric details as per the Aadhar like age, finger prints, etc. The proposed system is comparatively an easy, inexpensive and reliable method for identification of missing children with the help of his/her Aadhar information.

B) PROBLEM DEFINITION

In the case when a child is too young to speak or remember his/her address or not able to identify the parents. It takes more time to find that child's authentic details. There is a need to focus on this issue and provide a solution to it in order to reduce the stress on investigation authorities; thereby making the process faster. The existing method is quite hectic and time consuming to identify the address of the missing child. Also during manual process number of manpower for searching lost person is not sufficient. In order to make it simple and tech-based for combating the human trafficking specially child trafficking, a government portal linked with Aadhaar biometric information system may be conceptualized for integration of information. This supports the police officials to locate the child's address anywhere and notify the officer of the area to where the child belongs.

3. OBJECTIVES

Our goal is to develop a model which could be implemented by our police department to identify the Missing Childs from the Aadhar dataset. It is a Machine Learning based project which primarily works on facial recognition and matching of fingerprints, age and other Aadhar info in the later phases. Functionalities provided by Missing Child Identification System are as follows:

1. Upload photograph of missing individual
2. Matching the photo with the Aadhar dataset
3. If there is no close match, there would be a feature to match other biometric details
4. Once a match is found, the Aadhar details of that individual would be extracted and displayed in the Found directory of the respective officer to whose area the missing individual belongs.
5. It will link the authorities making their process simpler and fast.
6. This system is designed for the simplification of the manual investigation process to reduce Human trafficking issues and ensure the security in our society.

4. REQUIREMENT COLLECTION

Requirement collection has been done by interviewing the main Actor (police authority) and made some conclusions about police officers and their problems for finding the identity of a missing child. But it is not practically possible to comprise all the factors concluded from the conversation because of the unavailability of data for certain factors. Taking the data from the user and then validating with the database of the UIDAI data will be in the form of photo

1)Data
•Aadhar Details
•Details of Police Authorities
•Region information
2)Function
•User Authentication
•Input data
•Data Validation
3)Behavioural
This model has to meet the accuracy for better identification of missing individual, User-friendly interface so that non-technical users can also use the website efficiently
•User friendly
•Accuracy

5. METHODOLOGY

A. Data Gathering
We gathered face photos and ID card photos from 200 students at Shrama Sadhana Bombay Trust's College. Therefore, the number of face photos and ID card photos for data were 200 pairs. A sample pair of face photo and ID card is shown in Fig. 1.

B. System Design
In Fig. 2, the system flow starts with the ID card detection. Then face detection is executed before face comparison which is the final step.

1)   ID card detection: The ID card photo sizes are not equal. To start detecting face, every image is adjusted to the same scale. ID card is surrounded by a white frame and cropped by perspective transformation. Performance of ID card detection is 100% for data gathering.
2)   Cropping face by the ratio: Since several ID card images have different resolutions, the numbers of pixels for the cards with the same size are different. Therefore, we need to find the ratio of a cropped face and an ID card. Cropping face by the ratio needs to measure the width and the height of the ID card image and face image.
3)   The Face detection: MTCNN detector for face detection and alignment model.
4)   Face comparison: Keras that uses VGGFace as a backend with modified input and output layers. We determine whether two faces are similar or not by using a threshold. If the distance value is less than a threshold, that means two faces are similar. On the other hand, if the distance is greater than a threshold, that means two faces are different. Based on our experiments, one of the threshold values that result in an optimal performance is 0.35.

6. APPLICATION

•Cop Login: At this page, authorities would be able to login to the portal.
•Home Page: Photo of unidentified child area list everything will be here.
•Police Authority Dashboard: It would contain the list of missing child identified of their area. Along with that it would contain the feature of uploading photograph of child. And later give it to the model for comparison.
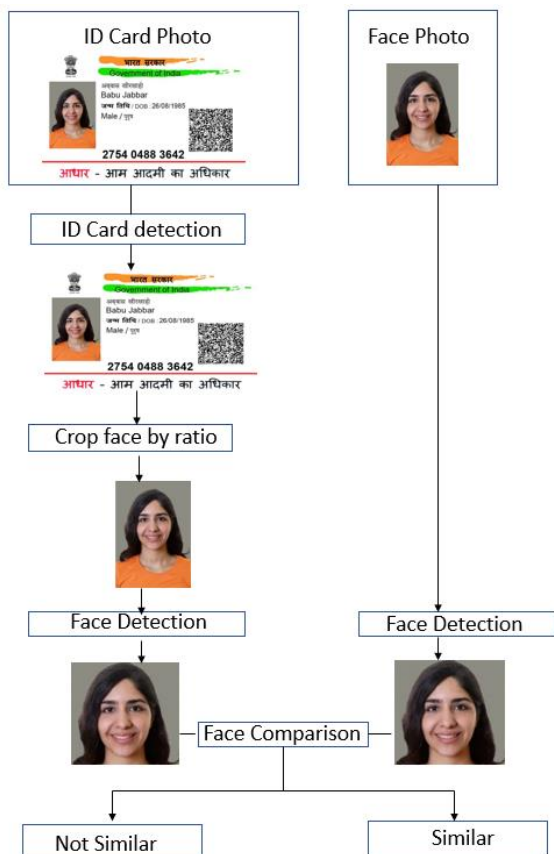

Fig 1: Sample pair of face photo and ID card

Fig 2: Working of model

7. DESIGN

A. System Architecture

The System Architecture provides the details of how the components or modules are integrated. This architecture will give a complete description of the input and outputs of each process. A system architecture is the conceptual model that defines the structure, behaviour, and more views of a system. An architecture description is a formal description and representation of a system organized in a way that supports reasoning about the structures and behaviours of the system.experience for both educators and students alike.
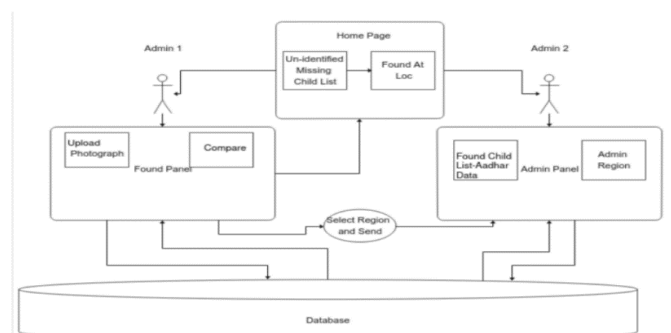
Fig 3:- System Architecture

B. Level 1 DFD

A level 1 DFD notates each of the main sub-processes that together form the complete system. We can think of a level 1 DFD as an "exploded view" of the context diagram
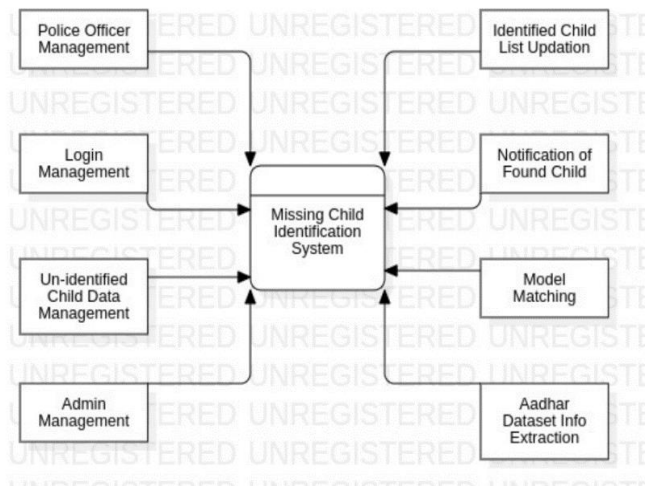
Fig 4: DFD diagram

C. Use Case

Use case diagrams are a set of use cases, actors, and their relationships. They represent the use case view of a system. A use case represents a particular functionality of a system. Hence, a use case diagram is used to describe the relationships among the functionalities and their internal/external controllers. These controllers are known as actors.
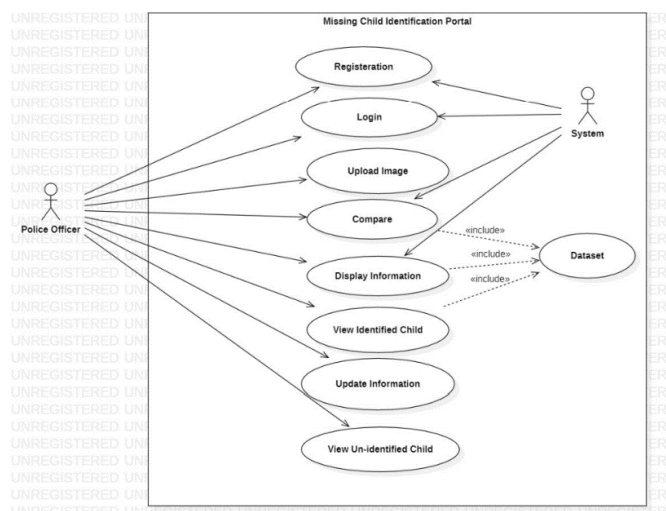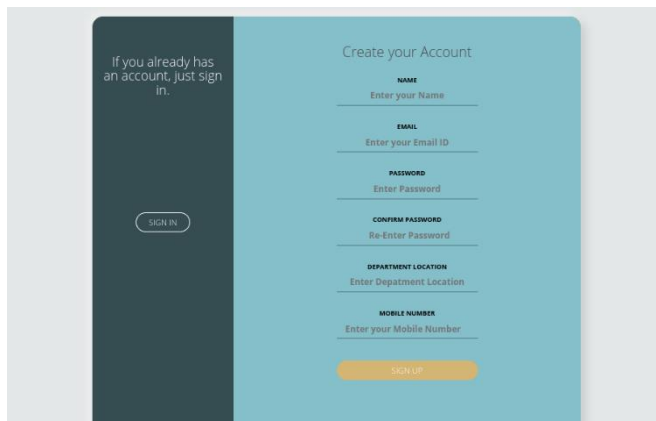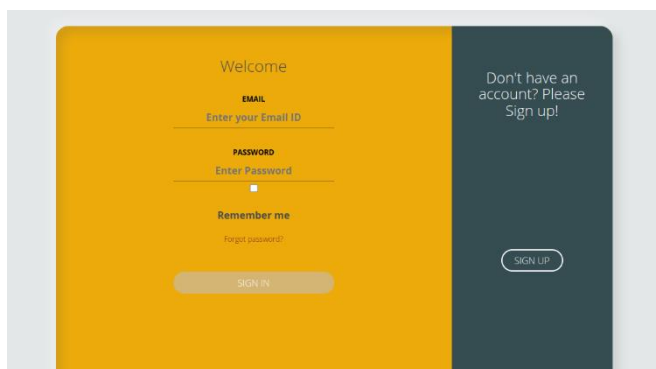

Fig. 5:- Use Case

8. USER-INTERFACE

Sign Up: Users can register as cops with their details. After successful registration, they can proceed to login.
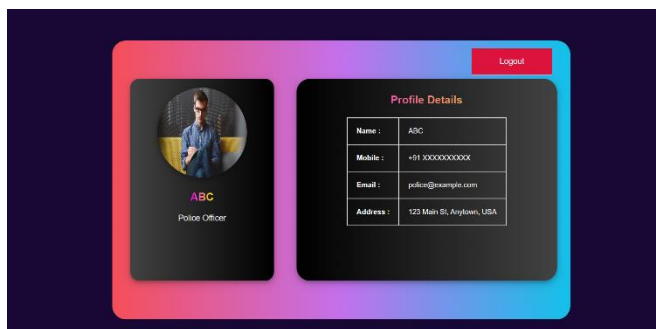

Sign In : Registered users can login as cops. If the users are authenticated, they will be directed to the dashboard or profile page where they can see the information about missing identities, updates etc.

Dashboard : It shows information of the User like their department location and mobile number. It has a feature to upload the missing child photo for finding their aadhar card details. They can even upload the fingerprint image. The results of the matched ones would also be displayed in this area.

9. CONCLUSION

As mentioned already the authorities don't have actual data of missing child/person. It is difficult for them to find data about missing child, so this portal will compare the photo of the person/child with the dataset of UIDAI and will provide the Aadhar information about the child/person. The main aim for this project is to identify missing person with the help of Aadhar information system and also to communicate the information of the missing person between authorities in different areas. In this project, GUI application displays login of respective district officer and list of missing people in their area. It easily handles the data and model that would ensure more accuracy of the matching person. It helps to get better accuracy and instant results, because of this it is easy to handle and reliable. This project provides a lot of features to manage all the data in safe manner.

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