FIND MISSING PERSON USING AI (ANDROID APPLICATION)

Sanskar Pawar[1], Lalit Bhadane[2], Amanullah Shaikh[3], Atharv Kumbhejkar[4], Swati Jakkan[5]

[1-4]Department of Computer Engineering, JSPM Narhe Technical Campus, Pune, Maharashtra, India

[5]Assistant professor, Department of Computer Engineering, JSPM Narhe Technical Campus, Maharashtra, India

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Abstract - *Face recognition is a biometric-based technology that mathematically maps a particular person's or individual's facial features and stores all that data as a face print. By using this technique, the information of the face of a person is saved mathematically or in the format of graphs in the database, which is used for detecting that particular face. Face recognition model in our system will find a match of that person in the database. If a match is found, it will be notified to the police and the guardian of that person.*

In this paper we will use the ideas of the Tensor Flow which is based on Machine Learning (ML) and will detect faces with the maximum accuracies to find the missing person.

Key Words: *Tensor Flow, Google Cloud Firebase, Face Recognition, missing person, Google maps, Activity.*

1. INTRODUCTION

In the world, a countless number of people are missing every day which includes kids, teens, mentally challenged, old-aged people with Alzheimer's, etc. Most of them remain untraced. This paper proposes a system that would help the police and the public by accelerating the process of searching using face recognition.

Face recognition technique can be used for many things and finding the missing person is a biggest advantage for any face recognition technique. To make the task of finding the missing person easier we are planning to make an application which will be accessed by some volunteers through which we can find missing person in short span of time. This will make the work of police to find a particular person easier.

Meanwhile, there is a need of automation for automating the task of finding the particular person by recognizing particular image and comparing that image with other image in order to check whether both images has same characteristics or not. By doing this we will come to know whether the missing person in the image clicked from particular location is correct or not, and if it is correct then police can start their next steps to find the person from that area.

Here in our Android application we have built face detection system where if match found volunteer will be redirected to the missing persons profile where user will be able to get exact location of missing person with Google map integration also user can chat with the person who posted that profile and get the update from him as well.

Using Tensor Flow to build face recognition and detection models might require effort, but it is worth it in the end. As mentioned, Tensor Flow is the most used Deep Learning framework and it has pre-trained models that easily help with image classification. The images are classified using CNN. In most cases, to generate a model means the classification of the images only needs to provide a similar image which is the positive image. The image is then trained and retrained through a process known as anchoring or Transfer Learning.

1.2 MOTIVATION

Physically it takes huge time, as it is lengthy procedure for finding missing person as it increases time to launch an FIR in police station. Also, during handy process workforce for searching missed person is not so great and due to this half of the cases remains mysterious.

An alarming fact about India's missing children is that 296 children go missing every day on average. And every month, that is a disturbing number of 9,019, half of them remain untraceable.

Shockingly, when India was dealing with the Covid-19 pandemic in 2020, the total number of children missing across India was 1,08,234, according to the National Crime Records Bureau data. 33,456 girls were reported missing, and 15,410 boys were missing, and 43,661 of them remained untraceable till the end of the year.

However, the statistics are indicative of the absence of a national Missing Children's repository. "There are no budgets earmarked for tracking missing people," said an official source.

2. EXISTING SYSTEM

When we went through the website, we immediately understood the issue. The process to submit pictures of a child (you find suspicious) in your area is tricky and not anonymous.
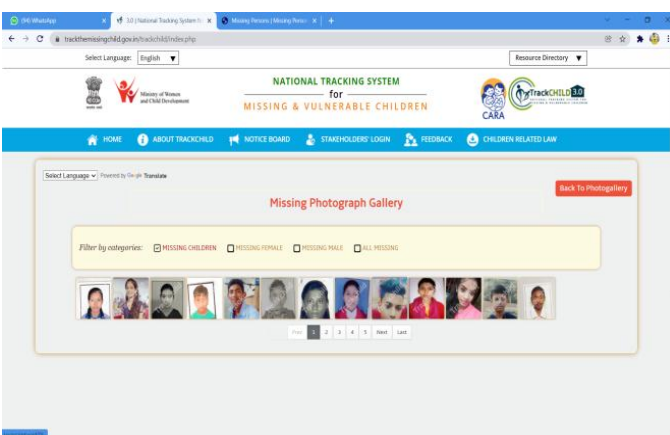
People who employ these children are powerful people nobody wants to mess with; this is why the user prefers anonymous submission.

The initiative wasn't using the power of machine learning. Since it is happening on a large scale, there should be an automated solution.

As shown in below image we can access all information of missing person under the tab of 'Photographs of Missing persons' as well as we can access the photographs of recovered children under the tab of 'Photographs of Recovered children.
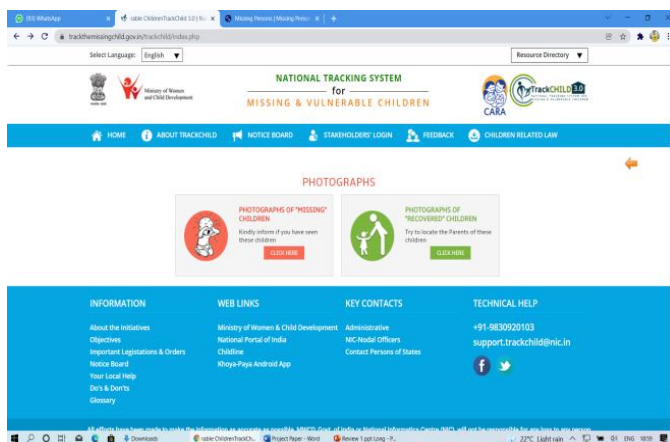
By clicking on 'Photographs of Missing children' we can get all information as well as photographs of missing persons as shown below:

They have published it for peoples that really want to help police for finding the missing persons. But if people who employ these children as child labors or any dangerous purpose got that particular person's information on the website then those people will definitely make things difficult for that person. In this way the information present on website can be misused by such peoples.

3. LITERATURE SURVEY

We did lot of survey and summed up following regarding literature survey so firstly, S. AYYAPPAN and his fellow mates from IFET College of Engineering have a presented a paper which deals with a similar problem statement and objective. The system proposed by them makes use of Deep Learning based Facial Feature Extraction and matching with stacked convolutional auto encoder (SCAE). The images of missing Persons are stored in a database. Faces are detected from those images, and a Convolutional Neural Network learns features. These learned features were utilized for training a multi-class SVM classifier. They used this method to identify and label the kid correctly. The main difference between their work and ours is that we are going to create a dataset of lost persons with the help of people who want to contribute to society (voluntary work). And their system involves complex algorithms which make the process of extraction and classification slower [1].

Previously, Shefali Patil and his fellow mates from SNDT Women's University, Juhu, Mumbai have a presented a paper which deals with a similar problem statement and objective. The system proposed by them uses KNN Algorithm which makes use of 136 * 3 data points to recognize Face. The main disadvantage of using the KNN method is its accuracy 71.28%. The main difference between their work and ours is that here we are going to create a dataset using a mobile application with voluntary work of people. we are going to use Tensor Flow with trained model for face recognition. Also, our dataset is going to be stored in the cloud database e.g firebase.[2]

In August 2016, Rohit Satle and his team presented a paper which addresses the face recognition system built by using Principal Component Analysis (PCA) method. The two main drawbacks of applying the PCA method are that computational complexity is high, and it can only process faces with similar facial expressions. The main difference between their project and ours is that in we are using android application for to create voluntary database of missing person with our android application. Also we are going to use tensor flow for face recognition.[3]

According to the research paper presented by Birari Hetal and her fellow mates from Late G.N. Sapkal College of Engineering, who had also deal with the similar problem statement and objective. They have made the Android application for making the task of missing person easier. The Android Application proposed by them makes use of SWF-SIFT algorithm for comparing two images. In their application, only Admin and some trusted people like police, etc., can update the data set continuously. The main difference between their system and our system is that we are going to allow application users for uploading images (update data sets) of suspicious peoples like child beggars whom they think that they are missing. Although the images

uploaded by that particular user is not viewed on our application. So we are trying to keep that data in safe hands.[4]

4. PROPOSED SYSTEM

The proposed system makes use of various methods for finding missing people.

The system structure is presented in **Fig.1**.

Overall Structure of Proposed System to prevail over the drawbacks of previous systems. In which you can add the case easily and detect the face on your fingertips and get the result if the match found. You will get exact location of the matched person with volunteers contact details.

The face recognition model in our system will try to find a match in the database with the help of Tensor Flow. It is performed by comparing the face encodings of the uploaded image to the face encodings of the images in the database. If a match is found, it will redirect user to that person's profile where location and volunteer mobile no is mentioned to contact.

The proposed system contains the following Modules:

Sign In/Sign Up Activity:

- User will first go to sign in fragment if he/she has not created profile then user will go to sign up.
- In Sign Up user will have to enter username, email and password.
- After entering this user will receive verification link on email and user will have to click on that link to get verified.
- After authentication user's profile will get created.
- Police also sign up using same method just they need to enter their location(Google map integrated) with mobile number so that their profile will get created to that specific location on Google map.
- User can sign in into the account.

Add Report/Case Activity:

- Here anybody will be able report the missing person.
- User need to enter missing persons details like name, age, height etc. with the location
- User can select exact location with Google map integration.
- Also need to upload image of missing person for face detection.

- This will create missing persons profile and it will get added in missing persons list.

Detect Face Activity:

- In this activity user will be able to match the faces.
- User need to hold the camera in front of suspicious person who he thinks that is missing.
- If the match found in cloud database that is firebase then that user will be redirected to profile of that missing person.
- On profile there is location of that person with reporter's mobile number and other details.

Police Locator Activity:

- When police sign up through the app they need to provide their location (Google map integrated).
- On that exact location in this activity map is marked with that police profile.
- User/Volunteer will be able to easily find and contact police authority with this feature.
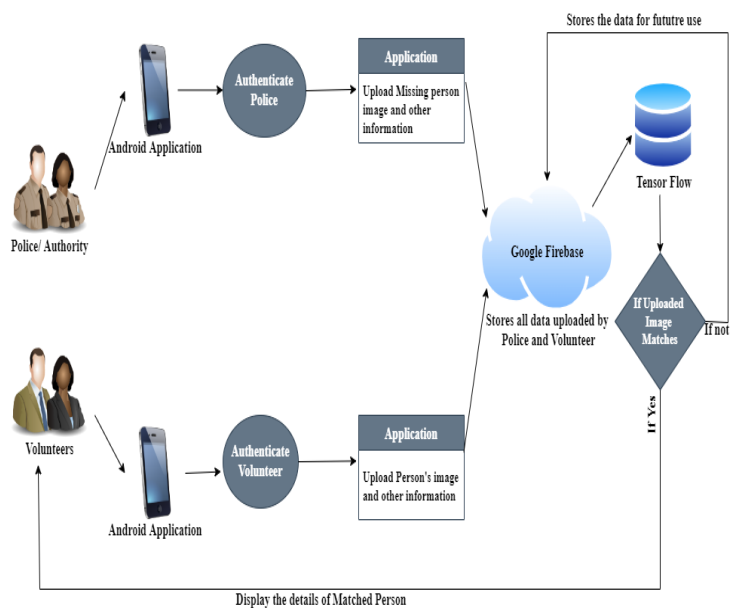

Fig -1: Flow

Chat Activity:

- In this activity volunteers are able to chat with each other.
- When someone reports the case there profile gets attached to that case and now anybody can chat with them regarding that particular case.
- In the chat activity there you can send text message and images as well.

- All standard chat app feature is there like message is delivered, seen and next user is typing when he was last online etc.

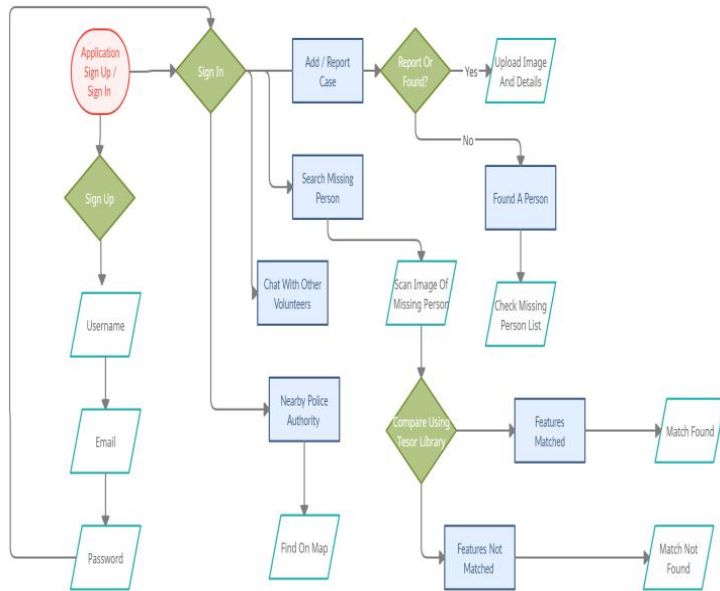- When you sent chat to anybody they will get notified as well.
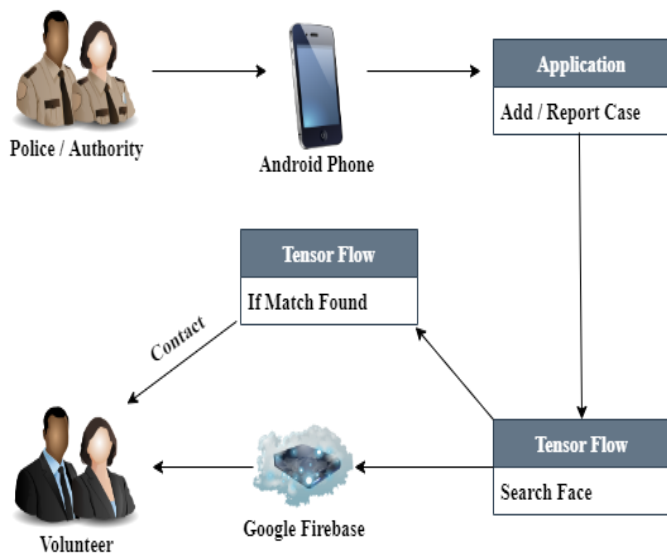

Fig -2: Structure of System

Fig -3: Architecture

4.1 TECHNICAL PROPOSITION:

TensorFlow is an end-to-end open-source platform for machine learning. It has a comprehensive, flexible ecosystem of tools, libraries and community resources that lets researchers push the state-of-the-art in ML and developers easily build and deploy ML powered applications.

Using TensorFlow to build face recognition and detection models might require effort, but it is worth it in the end. As mentioned, Tensor Flow is the most used Deep Learning framework and it has pre-trained models that easily help with image classification. The images are classified using CNN. In most cases, to generate a model means the classification of the images only needs to provide a similar image which is the positive image. The image is then trained and retrained through a process known as anchoring or Transfer Learning.

Years back, finding that model for training and retraining was difficult. Now, TensorFlow has simplified the process.

In our application there will be the feature of saving all the data of the missing person so that system can detect that image data and trace the missing person.

We have also created an Android Application for finding out the missing persons more efficiently. In our application we have tried to implement a lot of functionalities like login with Authentication where user will require the email-id and password for log in into our application also we have firebase verification for email authentication. We can also report the missing person along with its particular locations with the help of Google Map Integration as well as the locations of the nearby Police stations and the location from where the missing person is reported will also get visible on the Map. Our application will maintain a list of the missing persons as well. Matching up of the various faces will also be done in our application with the help of the 'Tensor library'. (Ref Fig.3)

5. Results

We have made an Android Application that consists of the features like Face recognition that will be used for finding the missing person, Google maps for police location finding etc... Some of the Screenshots of our applications are -:
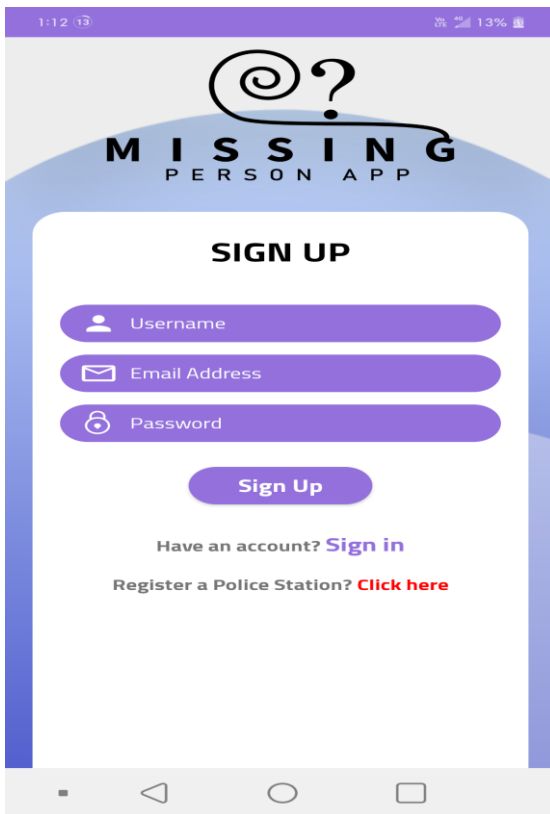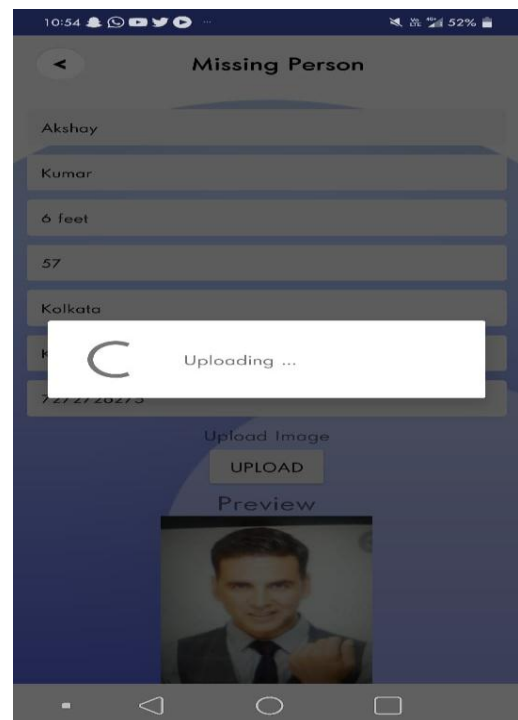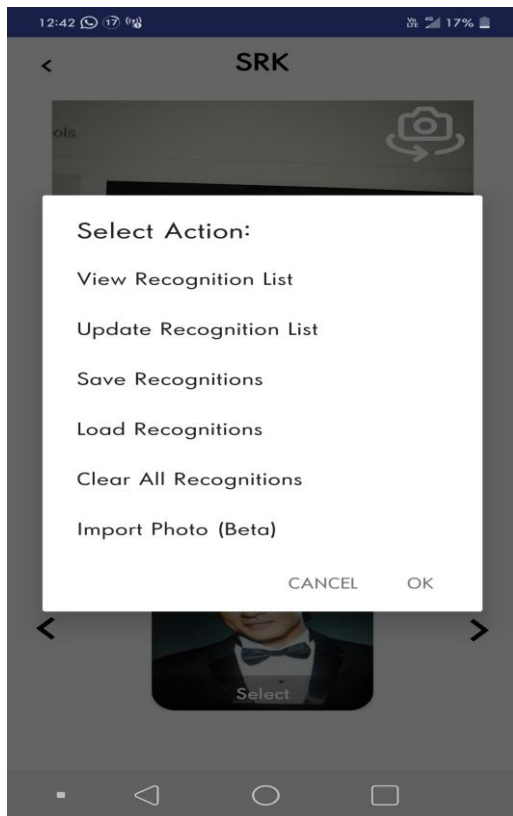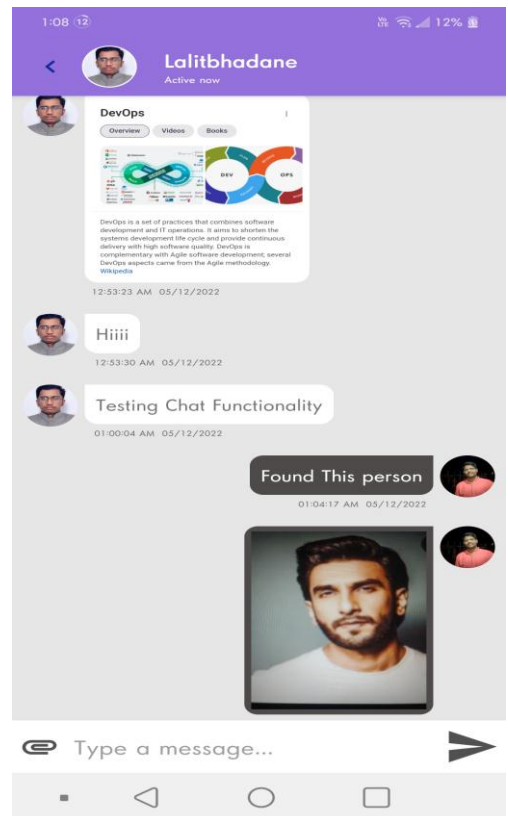

Sign up
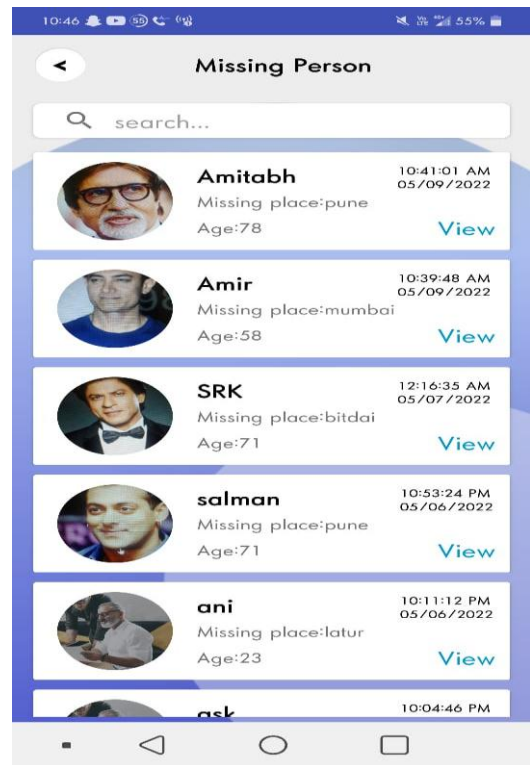
Missing Person List

Dash Board

Add/Report Case

Various Actions

Chat With Volunteer

Missing Person Scan

Police Station Locator

6. CONCLUSION AND FUTURE SCOPE

Image recognition with the use of one-shot learning has become very powerful. This technology when put into good use, can be beneficial. It can even be used in Hotels, Hospitals, etc., to find criminals instantly.

Process of identifying the missing people is fastened. Our system replaces the manual scanning process through the databases for each picture to check the match, by an efficient face recognition method which finishes the work in no time.

It will be useful to get exact location of the person if match detected with the Google maps integration which also makes police job easy. it will be helpful to contact police quickly as well.

By using the TensorFlow Face recognition we are trying to achieve almost 77.99% accuracy with the help of pre-trained model.

In the future, there is a scope to extend this system further by connecting our system to public cameras and detect faces real-time. The frames will be continuously sent by the public cameras to our system where our system will be continually monitoring the frames. When a lost person is identified in any of the frames, It will notify the concerned authorities, the method that finishes the work in no time.

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