Face Recognition for Advance National Tracking System

Sanket Bhujbal[1] Pankaj Bhamare[2] Rahul Umap[3]
[1,2,3]Student
[1,2,3]Department of Computer Engineering
[1,2,3]University of Pune Pune, Maharashtra, India

Abstract— The concept of advance national tracking system is adopted from the well-known web site of Government of India known as National Tracking System which is being used to find missing people, criminals, missing children etc.The proposed application will be used to implement the same ideology in order to generalize the existing system so that a normal person also can contribute with little or no efforts. The proposed application will use strong face recognition algorithm called Eigen face algorithm which will produce output with higheraccuracy. In this app we have to just click the photo and upload it to the application (server).   Then the server will perform the operation of finding the matching face. Using face- recognition algorithms. Server will be directly getting data (faces) from the users who get the missing person. This app can be used by the police for further verification. The main goal behind developing this application is to facilitate our society by providing a simple way to help in finding missing people just by spending few minutes.

Key words: National Tracking System (NTS), Eigen Face, Cover Images, Gryascaling, Eigen Value

I. INTRODUCTION

Every day we read or listen about the missing people. In newspapers we read at least two-three missing complaints. Recent incident of Kedarnath reminds us the use of a system which can find missing people. Keeping all these points in mind this application is proposed. The goal behind developing this application is to find missing people as soon as possible by using the technology. Nowadays everyone can afford an android mobile so by developing an android application more people can use it as well as can contribute in order to help the society. The application will provide user friendly GUI so that a normal person can understand it and can use the application without any trouble. Following mentioned points will clarify the idea more precisely.

A. Purpose of the Project:

In India every year 90,000 children missing reports are filed in police station. Very few of them are able to get their families back .Our missionary to finding the missing person is very poor which directly impact on families and eventually on society. There is no effective and efficient way to get back the lost people. We are in tech age, we can use it as advantage to find out the lost one. This is the reason behind developing this proposed application. The application will help families to get back their missing loved ones also it will speed up our traditional searching system.

II. EXISTING SYSTEM

The world of missing children is unknown and there is no proper study or research on this issue. Even today the exact figures of missing or traced children are not available. The existing legislation requires the State and district authorities to periodically carry out inspections/surveys of places where children are employed with a view to identifying missing children and those engaged in bonded labour/child labour. This task has remained a low priority area. There is an urgent need for the State administration to undertake micro studies especially at the places where children are reportedly vulnerable. A village-wise survey of all children who have gone missing or even recovered is an urgent need to understand the realistic dimensions of the problem. Studies by academic institutions into various factors behind the vulnerability of children are recommended in order to generate right response.

A. Missing Children From Across Border:

This is a grey area, which largely remains unaddressed. It has been reported that several foreign children who have been trafficked into India have been punished as illegal immigrants and are made to suffer. NHRC recommends the state governments to undertake review of all such cases and provide relief to such children, as all trafficked children, irrespective of their nationality, are children in need of care and attention. Moreover, there is a need of developing a Protocol on this issue. It is learnt that UNODC in its anti human trafficking project can provide the required technical assistance. In this regard the Ministry of Women and Child Development can utilize the technical assistance of UNODC and in close coordination with the MEA, develop a protocol on this topic. The Project Coordinator, UNODC may provide the required technical assistance .The existing for the missing person is very complicated and not that much user friendly because of its awareness. The existing system to find out the missing person is   commonly police stations the missing person families files case of missing person to the police station .the procedure in the police stations too much time consuming and it need to be very patience person. But the missing the person is very sensitive .The legal procedure in the police station is given below:

B. State Police Policy:

State Police policy calls for the officer assigned to a report of any missing person (including children, juvenile, and adults) to (1) assess the situation and "immediately" complete an initial report (Form DPS-159-C) that includes a physical description and personal history of the missing person, (2) disseminate this information "as soon as possible," determine an appropriate initial search effort based on the specific circumstances of the situation, and search the person's residence and last known location.The policy states that the responding trooper should consider a greater initial investigation or search in the case of a missing child or an elderly or other at-risk person. If the child is under age 16, the trooper must immediately notify the troop desk. The troop desk must alert all on-duty personnel and provide a description of the child, his last known location, and other pertinent information. The responding trooper

must complete a local area search and report on this investigation. The duty supervisor must notify the troop commander if it appears that initial efforts or a follow-up investigation will require more resources than the troop can provide.

C. *How can you report someone missing to the Police?*

First hand reporting from a relative or friend is the most common way that Police are notified of a missing person.

We will take reports of missing persons in any of the following ways:

1) Dial 101 to speak to your local police
2) By a visit to a police station
3) Contact with a Police Officer/Police Staff away from a police station

D. *What Happens When You Report Someone Missing To Police?*

Once a Police Officer has taken a report from you about the missing person, he/she enters all the information onto a computer at the police station and circulates the person as 'missing' on the Police National Computer. Now that that information is on the computer any Police Officer nationally or internationally can contact us to find out more in-depth details.

Immediate enquiries are undertaken by the Initial Investigating Officer to try to find the missing person as soon as possible. Should they still not be found then the investigation is passed onto a nominated officer within the police station who will now deal with all further enquiries that can be carried out. The officer will firstly make sure that we have all the necessary details so that an efficient investigation can be conducted, these will include details of:

1) Details of friends or relatives
2) Places that the missing person is known to frequent
3) Health or medical conditions that they may suffer from
4) Financial account details (such as bank account, credit and debit card details)
5) Details on any benefits that they may receive, and the location of where they may collect them from
6) A number of recent photographs
7) Events that could be linked with their disappearance
8) DNA sample for subsequent forensic examination [i.e. toothbrush]

Officers will also need to search with your consent the home address to establish if there are any further evidential leads [this is a normal procedure].Consent to publicity will also be sought from you. We have found that using the media to appeal for information can be very effective. Provide the police with information about the missing person. In order to complete the missing persons report, you'll need to provide detailed information about the missing person's physical characteristics as well as where he or she was last seen. Have the following information ready when you go to the police station to file the report:

1) 3 current photos of the person
2) A physical description including height, weight, age, hair colour, eye colour, build, and so on
3) A description of the clothing and shoes the person was last seen wearing

4) A list of possessions the person might be carrying or articles on the person, like jewellery, glasses, contact lenses, accessories, a purse, a wallet, ID cards, and so on
5) A list of scars, tattoos, and other identifying characteristics
6) A list of medications the person was taking, allergies, handicaps, and other medical conditions
7) A list of people related to or friends with the missing person, along with contact information
8) A list of places the person frequents
9) A description of the car the person may be travelling in, or a different mode of transportation if applicable

This is the police station procedure and some legal advisory from the police stations. Media is also the part of the search of missing person. Missing families usually gives the advertise of the missing person with some rewards. Media like newspapers, news channels flash the news of missing person for some of the days. Database of missing person maintained by the Govt. of India that is national tracking system is also the existing solution for the missing person(3);

E. *National Database and Monitoring:*

NCRB should establish a National Tracking System that would encompass the grass-root level in locating and tracing missing children. There should be prompt reporting of not only missing children cases, but also of return/rescue/recovery. All instances where children are rescued from places of exploitation including places of sexual exploitation and also exploitative labour , should be dovetailed into the NCRB data base. The database should be updated on a regular and systematic basis. This also involves revising the reporting format with respect to the rescue and recovery of persons who have been trafficked. The Director NCRB should liaise with the Project Coordinator, Anti Human Trafficking UNODC, New Delhi and workout the format as the UNODC is working in the field of empowering law enforcement agencies and developing appropriate projects etc. with respect to Anti Human Trafficking and related issues. This could be made effective through web-based and other intra and inter State networking linkages. The information that is gathered ought to be appropriately disseminated. It is suggested that the NCRB evolve one-page useful position papers that has information with regard to various crimes, including the relevant statistics. This could be useful and accessible tool for different agencies that are dealing with a particular problem. For example, relevant information relating to missing children, if it is put in a page or two will be far more accessible and readable for all stakeholders than information complied as part of a voluminous report prepared by the NCRB.

F. *CRB/DCRB:*

There is an urgent need to revive State/District Crime Records Bureaux. The database on missing persons, their return and the processes involved should be properly documented. The State Missing Person's Bureaux (MPB), needs to be revamped, made functional and strengthened. The officers should be well trained and knowledgeable to address the issues in an analytical manner and from the

perspective of Human Rights. The SCRB and the MPB should have proper liaison between them, so that the database of SCRB and NCRB are dovetailed to the functioning of MPB and the Special cell/ squad to be set up in the Police Stations. The MPB data should be specifically updated with the data of rescued children from trafficking crimes.While gathering data related to our project topic we come across two main existing websites of government which were similar to our project. But these applications use static data i.e. the database from where the data necessary for the computations in application used is static in nature whereas our application uses real time data for computations.

G. Drawbacks of Existing System:

Drawbacks of existing systems mentioned above are as follows:

1) Police Stations:

Police stations in the India files the report of the missing person And provide all these information to all India police stations to find out that person.

2) Issuing Person Squared/Desk In Police Stations:

The Committee recommends that every Police Station across the country should have Special Squad/Missing Persons Desk to trace missing children. This Squad/Desk should have a Registering Officer who should be made responsible of registering complaints of missing children. But every local police station don't have the missing person squad.

3) No Real Time Solution:

Police find all the possibilities of missed person. But they don't have any real time solution. They can't track the person through the online system.

4) Electronic Media:

The news of missing person flashed on television and newspapers for certain period of time. After few of days, everyone forgot that news there is no permanent source to store and flashed that information.

5) National Tracking System:

The Govt. of India maintained website and database of national tracking system. To store the information of the missing person is for tracking them .the database is just storing the information that is anyone from the missing families upload the photo. But there is no real time solution in the view of the cases. Very few use these sites and database. So there is no more user than the missing families in the society .Efficiency of these site is also very low. The NTS graphical user interface is very poor quality. So that no user can go with this interface .The NTS is taking just 3-4 photos of the missing families so that the accuracy of the matching the photos is also very low(4) ;

III. PROPOSED SYSTEM

The concept of the project to develop the application to find out the missing person .The proposed system will consist of an android application(acting as client) and a server side java application. The client will upload the photo of missing person on the server. The server application will match the uploaded photo and search for the matching profile from the database. If found it will return the result back to the client otherwise it will add the uploaded photo with the description into the database for further use. There will be no need to create any account to use the proposed application. Anyone who has android mobile can use the application to upload the missing person details. This feature will be useful in order to spread awareness among people about their responsibilities. As there will be less overhead in using application and submitting information to the server, people will come forward to help others in finding the lost one.

A. Advantages of Proposed System:

1) This application provides us real time solution, very fast & instant.
2) Automatic face recognition.
3) Shows related partially matched patterns / images in case face pattern not matched with any case.
4) Centralized data so searching & sorting data is very easy & instant.
5) Users are able to complaint online & get feedback online

B. Disadvantages of Proposed System:

1) Face recognition may fail if the photo uploaded is too old or some features of face in photo are hidden (example goggles or sun glasses).
2) Face recognition algorithm only works more accurately when it had 15-25 photos of missing person.
3) If we got the person who had lost from so many years we require here manual identification of that missed person to get the partially matched result.
4) Eigen face algorithm is sensitive to head scale.

C. Proposed System Features:

1) Provides simple and attractive GUI.
2) Easy to use.
3) Secure to avoid misuse of the application by anyone.
4) Overcomes drawbacks of the existing similar applications.
5) Keeps record of users who are using this application.

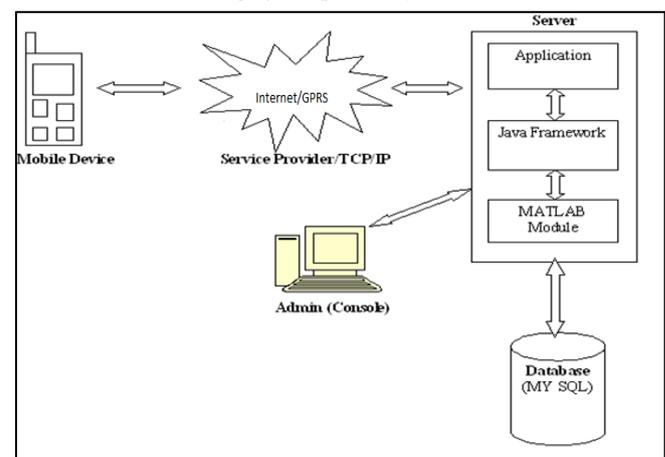*D. Detailed Working of Proposed System:*

Fig. 1: Architecture of Proposed System

Above diagram shows the architectural view of Advanced National Tracking System. We are using 3 basic components

1) Mobile Device
2) Database

3) Server

Diagram shows the control flow of the System. Server and database are the root of the system and mobile device is the at other end of the system. Main processing will be done at the server end. Mobile device can only use the service of the the server. i.e. Face recognition will be done at the server. Mobile will only provide the input in the form of image of the victim and view the result. Internet will be interface between them. Our implementation will be a server with a National Tracking System Program running forever for the requests and an Android app. The app will be a client program and NTS will be server program.
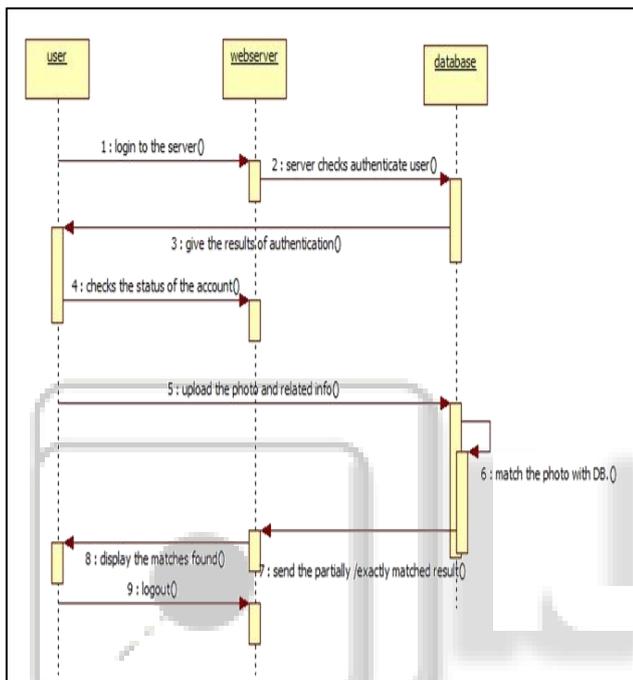
E. Sequence Diagram:

Fig 2: Sequence Diagram

Sequence diagram are use to show work flow and message exchanged between object or among the element. Show the interaction between object in the sequential order that those interaction occur. Messages are pass forward as well as reverse direction. Following are the some basic element in sequence diagram.

Info. Item	Information
Use Case	Face Recognition for advanced National tracking system.
Scenario Name	Computing the Effort and Duration of the Project.
Steps	– login to the server – user get identified from the – Server from authentication technique. – upload photo and related – Information to the server. – Get matching result from the DB. – show the partial and exact – Matching result to the user. – user give review on – The matching result. – Logout from the server.

Table 1: Sequence Diagram Description

F. Set Theory in Mathematical Model:

Our system can be represented as a set
$X = \{I, O, C\}$
where,
I = set of inputs
O = set of outputs
S_C = set of outputs in success cases
F_C = set of outputs in failure cases
C = set of constraints
$I = \{L, P\}$
where,
L = set of user logins
P = set of photos of missing people
$O = \{PD\}$
where,
PD = set of details of missing persons
$C = \{C_1\}$
where,
C_1 = "Input photo should be clearly visible"
$L = \{UN, PW\}$
where,
UN = set of usernames
PW = set of passwords
$P = \{P_1, P_2, \ldots, P_n\}$
where,
$P_1, P_2, \ldots, P_n$ are photos of missing people.
$PD = \{PD_1, PD_2, \ldots, PD_n\}$
where,
$PD_1, PD_2, \ldots, PD_n$ are details of missing people.
$UN = \{UN_1, UN_2, \ldots, UN_n\}$
where,
$UN_1, UN_2, \ldots, UN_n$ are usernames.
$PW = \{PW_1, PW_2, \ldots, PW_n\}$
where,
$PW_1, PW_2, \ldots, PW_n$ are passwords.

G. Feasibility of Project:

Our application uses a face recognition scheme. The user uploads the available photo of missing person to the server. The server then tries matching this photo to all the photos currently in the database. If a match is found, then the details of the missing person are sent to the user. Otherwise, a message, indicating that the person is not found, is reported to the user. Thus in either case, our application guarantees that we get output. Hence our application is NP-complete.

IV. CONCLUSION

The main idea behind developing the project was to facilitate the user by providing real time position of the missing person. More time of the user or say victim family is spent in waiting for the get result from police station. As the user is unaware about the actual location of missing person, so generally they are waiting for the missing person get back to home .Instead if anyone get missing person somewhere, by using this application we will find our missing person. The major goal of the project development was to facilitate user and try to help them to come out from critical condition .This public interest application will surely change the way thinking and great impact on society and market too.

A. *Future Enhancement:*

More work towards the project can be done by adding various components to it and the extension can be done in it.

So taking into consideration all these points, future enhancement could be the project can be expanded to find out the people who lost in accidents, calamity like earthquake flood like situations. Another future enhancement would be use for finding the criminals who escaped from the jails and also advance national tracking system can be used in unique identification system.

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