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AI-ASSISTED SEARCH FOR MISSING CHILDREN

1Austin Jeremia A, 2Kishore Kumar S, 3Keerthirajan A, 4Mr Mohamed Keeran V
1Student, 2Student, 3Student, 4Assistant Professor
1VSB Engineering College Karur,
2VSB Engineering College Karur,
3VSB Engineering College Karur,
4VSB Engineering College Karur

Abstract--According to (NCRB)figures provided by the Ministry of Home Affairs (MHA) in Parliament (LS Q no. 3928, 20-03-2018), a total of 1,11,569 children were reported missing up until 2016, and 55,625 of them were remained missing at the end of year. A GUI application was made in Python to aid the police open new cases and search for missing children as part of the AI-Assisted Search for Missing Children initiative.

Keywords-- Artificial Intelligence, facial recognition, Android, Machine Learning

I. INTRODUCTION

Numerous reports of missing children are made in India each year. When crime rates are at record highs, it is extremely disheartening to discover that children and other individuals going missing frequently.

Face recognition technology can be used to find missing children and victims of human trafficking. Given the alarming statistics, it's imperative to have a practical strategy for locating the missing children.

The management of missing person and kid records on a centralized database will be simpler with image. The records can be easily updated or deleted.

You can use it to include, more rapidly maintain, update, and delete records. This software will help the police and the guardians quickly find any missing person or child, wherever they may be.

II. EXISTING SYSTEM

The Mobile Face Nets class of very efficient CNN models, which are created with face verification technology with excellent accuracy on embedded and mobile devices in mind, are described in [1], Mobile Face Nets: with convolution. It was a method described in

[2] that generated a significant face dataset with a minimal amount of annotation work. Then, using the new training dataset, a number of CNN architectures for face identification and verification are evaluated, including a look at face alignment and task-specific learning methods.

The model in this work employs PCA for recognition in [3](facial). PCA is a highly efficient tool for data analysis.

The term "Eigen face" refers to the linear combination of weighted eigenvectors used to represent faces in PCA.

Around the country, security cameras will be put in key locations to offer live video feeds Their approach is described in [6] as follows: If a person is missing, the person who discovered them can do so on our portal along with the spot they were found, which wasn't automatically provided by their system, if face hasn't already been put to our database as a lost person. The search will go more swiftly as a result. Their system also employs advanced algorithms, which slow down the extraction and classification of the data.

These are the main issues with the older systems.[7] describes the PCA algorithm in this work, which comes after the face recognition system. One of the techniques most frequently used for reducing the number of components in face recognition is principal component analysis (PCA).Faces are modelled in PCA using Eigen faces, a linear combination of weighted eigenvectors [2][3][4].

These eigenvectors are produced from the covariance matrix, or basis function, of an image training set. When Eigen faces were obtained, the number of images in the training set would match that number. The architecture of a face recognition system typically consists of three basic processes: acquiring face data, extracting face features, and face recognition. They introduced the Mobile Nets class of efficient models in [8].for vision-based embedded and mobile applications. Thin deep neural networks are produced by Mobile Nets' efficient architecture with the aid of depth-wise separable convolutions. The model builder can select a suitable model size using hyper parameters based on the constraints of the problem. It performs well on ImageNet classification when compared to other commonly used models, and they undertake a thorough analysis of resource and accuracy trade-offs.

The database in this system stores the image that the guardian uploads. A subsequent match for We will use the face recognition algorithm of our system to locate that person in the database. If a match is discovered, both the police and the person's guardian will be informed.

The AWS face recognition system, which is powered by artificial intelligence (AI), was used in this article to find the missing person. The system will be able to retrieve that image information and find the missing individual by using the application's ability to save all of the missing person's information.

According to [13], the SWF-SIFT technique used by the authors to compare two photos ensures that 70–80 results based on the compared images will be produced. They made to achieve the desired results, employ the User, Police, Compliant Holder, and Admin modules. The database is updated frequently, and useless data is removed.

The suggested method allows one to locate a certain individual with the least amount of time and effort. Ideal face characteristics are predicted to have a smaller maximal intra-class distance than minimal inter-class distance in [14],

III. PROPOSED METHOD

- The proposed system AI assisted face matching algorithm is implemented for missing children prediction
- Deep learning based algorithm is implemented for train the face images
- The administrator must register a new case by logging in with their username and password.
- The admin maintains the user details and upload the face then we used the face matching algorithm for predict the face.

KNN Algorithm

The most fundamental supervised learning- based machine learning algorithm is K- Nearest Neighbor. By assuming a correlation between the new instance and the data and previous cases, this method places the new example in the category that most closely matches the current categories. It saves all of the current data in order to classify a new data point based on similarity. This demonstrates how the K-NN approach can categorize new data rapidly and accurately. Although it can be applied to classification and regression problems, the majority of its applications are in the former.

Pyqt5 and PostgreSQL

PyQt is a toolkit for GUI widgets. It is the popular and reliable cross-platform GUI library Qt's Python interface.
The PyQt API is composed of a number of modules, each of which has a variety of classes and functions. Totally free software The cross-platform GUI toolkit Qt is implemented by the Python plug-in PyQt. PostgreSQL, a potent, enterprise-class open source relational database, supports both SQL (relational) and JSON (non-relational) querying. The database system has a great deal of web and mobile compatibility

Methodology:

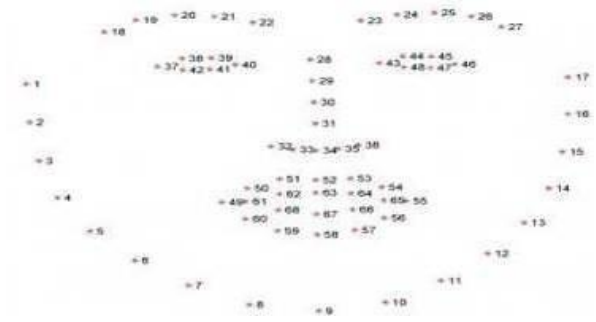

Fig.1 Facial feature identification

As shown in Fig. 2, where RED signifies Person 1, GREEN denotes Person 2, and BLUE denotes Person 3, consider how the facial landmark points are dispersed by KNN. The model will now attempt to predict confidence using facial landmarks that match to any person's face using the KNN classifier that was previously trained.

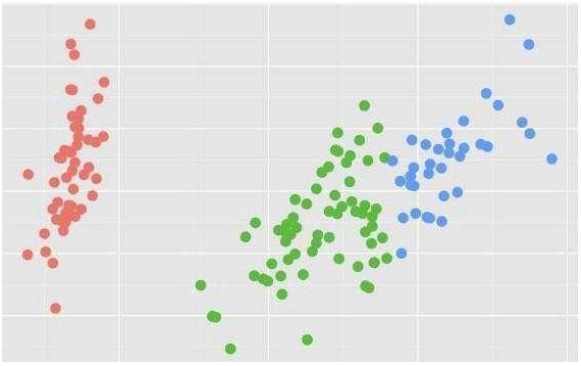

Fig 2. KNN Classifier

```
clf=neighbors.KNeighborsClassifier(
                        n_neighbors=3,
                        algorithm='ball_tree'
                        weights='distance'
                        )

clf.fit(x, uniqueKeys)
```

Fig 3. Code of KNN Classifier

1. N neighbors - This term describes the number of cases that have been recorded. Three incidents are recorded.

2. The matrix is composed of X-136 columns (the x, y coordinates of 68 face landmark points) and 3 rows (total number of cases that has been recorded).

3. 3. Unique Keys - Using Label Encoder, a person's information, such as name and phone number, is encoded with the appropriate row.

Implementation:

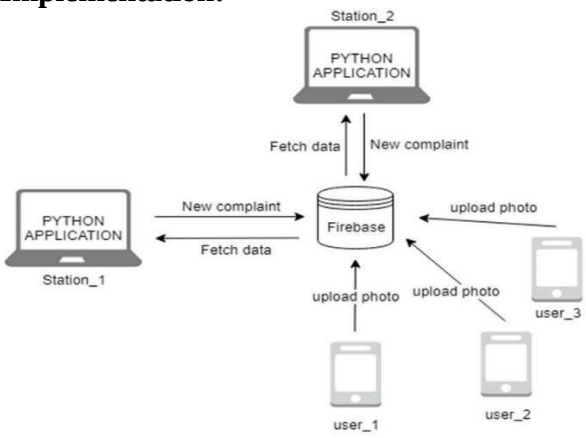

Fig. 4 System Architecture

Fig. 4 depicts the system's operation. This system, which has a very basic GUI and just requires the admin and regular users to follow a few simple instructions, was built using Python. The steps are detailed below.

1) Admin Login: The administrator must log in using their username and password to register a new case. PyQt5 was used to develop the application's GUI, and postgresql was the database of choice.

2) Adding new cases: When the administrator logs into his account, a new window allowing him to add any new cases will open. Options for registering a new case, updating the system, matching data already in the system, examining data updated in the system, and viewing confirmed cases are all available through this window.

3) User submission: The GUI allows the user to input information such as name, phone number, location where the photo was taken, and the image that was captured. Users can easily take images anytime they want and wherever they are by using a smartphone application that has been developed for them.

4) Comparing cases: The user-uploaded image and the case image must be compared in the next step. The images are matched using the KNN method. To train the model, choose the refresh option from the main menu. When the match button is pressed, the model will then match the two images. If both are present, it will either state "match discovered" or "match not found."

IV. RESULT ANALYSIS

GUI Application:

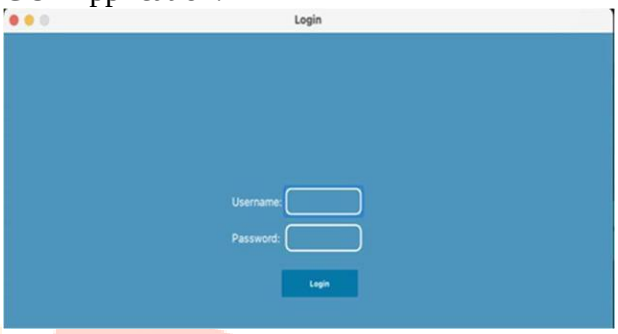

Fig 5. Administrator login page (By entering correct username and password admin can login through the application) The Administrator logs in to the application by entering the credentials as shown in Fig 5. The application includes features to add a new case, refresh the model, match the missing child present in the database, view the data in the Confirmed requests -

Fig 6. Main Application Page

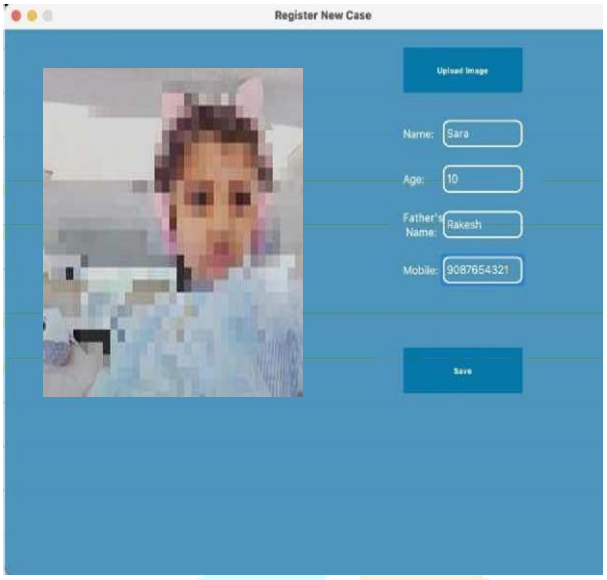

Fig 7. Register new cases

This is where all of the processed complaints will be kept and can be used to view submitted case after they are confirmed as shown in Fig 8 and 9. Match - It is considered a match if confidence rises to 60% or higher as shown in Fig 10

Fig 9. Image Submission

Fig 8. Window to view submitted case

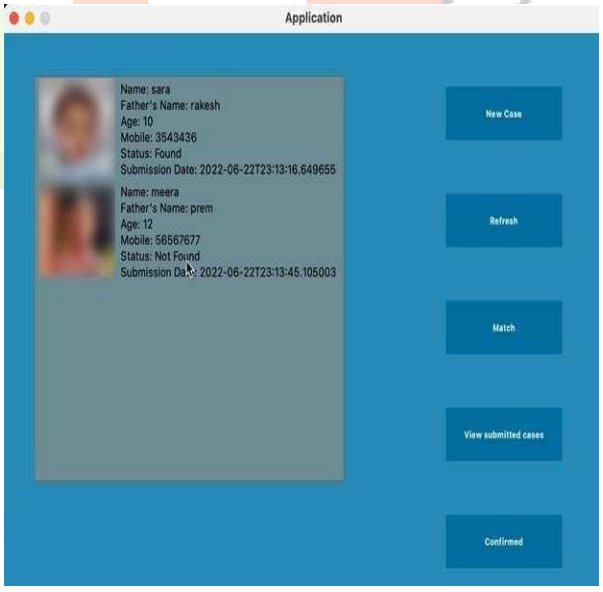

Fig. 10. Match the pictures to locate the missing kids.

TABLE I. TEST CASES

Id	Function	Details	% Test Cases Executed	% Test Cases Passed	Pending
1.	Login as an administrator	Enables the administrator to access the system	Successful	Successful	0
2.	Add cases	Adding new cases	100%	100%	0
3.	Refresh	Model is updated and trained.	100%	100%	0
4.	Match	User submitted image and the picture of the case stored in database are compared.	100%	100%	0
5.	Check Submitted cases	Observe the cases that the admin has entered	100%	100%	0
6.	Confirmed	The resolved cases are checked	100%	100%	0
7.	Picture Uploaded	The user can upload the image. This can be stored in the database for further processing	100%	100%	0
8.	Mobile application	Provides a picture upload and location option for common users.	100%	100%	0

V. CONCLUSION

This system serves as a working example of an artificial intelligence-assisted search for missing children that aims to find missing children. As it is investigated in this work, it contains a number of features and a wide range of practical possibilities. Making it simpler to locate and report missing children was the main objective, which was accomplished. This technique can be quite useful if applied properly. It can be used to locate offenders swiftly in public settings like hotels, hospitals, and other buildings.

The development of APIs for this application using Flask can be substantially improved. Tensorflow can also be used to build a whole web application.

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