AI-Assisted Search for Missing PEOPLE

M. Mohammed Ibrahim
Assisted Professor
Department Of Computer Science Of Engineering
Sona College Of Technology
Salem, Tamil Nadu
Ibrahim.cse@sonatech.ac.in

M. Sooraj
Department Of Computer Science Of Engineering
Sona College Of Technology
Salem, Tamil Nadu
m.sooraj2002@gmail.com

R. yokesh Kumar
Department Of Computer Science Of Engineering
Sona College Of Technology
Salem, Tamil Nadu
Yokeshkumar919@gmail.com

M. Sutharsun
Department Of Computer Science Of Engineering
Sona College Of Technology
Salem, Tamil Nadu
sutharsunms@gmail.com

Abstract— It is highly distressing that there are still unaccounted-for missing people in India every day. According to data from the National Crime Records Bureau, over 1,11,976 people are reported missing by 2019. The Ministry of Home Affairs brought this issue to light in Parliament, emphasizing that 55,625 of these children remained missing by the end of the year.

AI Assisted lookup for missed people is a Graphical User Interface program that has developed by Python to assist the crime department in finding missing people and in opening new cases. The provided image of the missing person is processed on the backend, and pertinent data is noted. Along with other information like name, parent's name, age, location, etc., this is stored in a database. Additionally, an Android application is produced that can be made publicly available. If the user thinks someone's photo is questionable, they can upload it using this app. It is possible to anonymously or obliquely send the picture. This photo is stored in the database along with its location. In order to match user-submitted photographs with police-uploaded ones, the GUI program uses a machine learning algorithm. When a missing person is found, any matches can be shown along with the location where they were last seen.

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

➢ preamble

In India, reports of missing persons number in the thousands each year. It is extremely unsettling to observe that, during these unprecedented times of record-high crime rates, missing persons are the norm.

• A society must be established in a way that ensures the health and safety of its members. To help anti-crime authorities find the missing individuals, a method for tracking and locating them must be established.

- Face recognition technology can help find missing persons and victims of human trafficking. It is imperative to develop a user-friendly and easily available way to locate the missing individuals inlight of the alarming statistics.
- Managing missing person and child records on a centralized database will be simpler with image. The records are easy to amend or remove. More quickly, records can be added, updated, maintained, and removed with its help. This software will help the guardians and the police find the missing person or children quickly, wherever they are at any time.

➢ RELATED WORK

The Mobile Face Net category comprises CNN models specifically designed for face verification technology, prioritizing high accuracy while being efficient for use on embedded and mobile devices. This information is detailed in the paper. There are fewer than a million parameters in these models. In essence, Multilayer Perceptron is a CNN that has been standardized. Convolutional networks are a type of advanced neural network that substitute convolution for standard matrix multiplication in at least one of its layers. It was a method that required very little annotation labor in [2] and generated a large face dataset. Then, using the new training dataset, Several architectures for facical validation and confirmation. are being studied, with attention given to factors such as

face alignment and the development of task-specific learning deveplopment. The model used in this research in [3] employs PCA for facial recognition. PCA is an extremely powerful method for data analysis. Eigen faces, a linear , are the PCA representation of faces. The eigenvectors derived from picture set serve as the basis functions for further analysis or processing. It was previously impossible to directly difference 3D and 2D techniques in the study until the database in [4] made it possible.

Many strategies, such as dimensional accumulation, genetic selection, and elimination, are used to merge systems. This work results in a novel multi-subspace face recognition technique that achieves state-of-the-art error rates, combines 2D and 3D data, and outperforms one sub system.
The Local Binary Pattern Algorithm is utilized in [5], and techno is reveal the where outs a person in Zimbabwe. The technology will help us focus our search on the appropriate locations by providing real-time information and video streams, rather than combing the entire country. Security cameras will be positioned strategically across the country to offer live video feeds.

According to [6], their process is as follows If a person discovers a missing individual, they can register them as found in our platform, providing the location where they were located if it wasn't ready suggested in system, provided that the missing people's face wasn't already been uploaded to our data. The search will go more swiftly as a result. Furthermore, the complex algorithms used by their system impede the speed at which the data is extracted and categorized. These were the main shortcomings of the previous systems.
The PCA algorithm is explained in this work in [7], which comes just after the face recognition system. One of the techniques most commonly used to reduce the number of components in face matching is Principal Components Analysis.

Faces in PCA are modeled using Eigen faces, which are a weighted eigenvectors in single combo [2][3][4]. The basis function, also known as the matrix, of a training made up of pictures is where these eigenvectors originate. The quantity of Eigenfaces obtained equals the total number of images in the training set. A typical face recognition system comprises three primary phases: facial recognition, facial feature extraction, and data collection for facial information.

The authors of [8] presented the Mobile Nets class of efficient models for mobile vision and embedded systems. Using depth-wise separable convolutions, the simplified architecture of Mobile Nets creates thin deep neural networks. Two global hyperparameters are given to balance latency and accuracy. The model builder can use hyper-parameters to select a suitable model size based on the issue's constraints. It performs well on ImageNet classification when compared to other popular models, and they go into great detail about the trade-offs between correctness and resources. The effectiveness of MobileNets is then demonstrated using a variety of use cases and applications, such as object detection, in-depth classification, facial feature analysis, and wide geo-localization.
In [9], the authors develop an adaptive threshold mechanism in order to improve recognition accuracy. A face recognition is developed an oversee virtual registration in addition to the registration procedure. Additionally, they offer a brand-new evaluation method for evaluating an algorithm's effectiveness in practical settings. Our proposed method can improve their strategy's accuracy on the dataset by 32%.
In [10], two normalization-related issues is identified & studied through math process, providing insights and guidance for parameter configuration. Drawing from this research, two training strategies are proposed, leveraging normalized attributes. The first strategy involves adjusting the softmax loss function to prioritize cosine similarity over inter product. The 2nd approach involves reformulated metrix study by introducing an agent over of each class. It is demonstrated that both approaches, along with minor adjustments, consistently improve performance by 0.5% to 0.9% on the Labeled face in the wild dataset across two models. This enhancement stands out, especially considering that the performance of both models on the dataset is already approaching saturation, surpassing 95%.

In [11], a program is presented the accelerates face recognition lookup for the success of both the public and crime departments. The uploaded image of the individual in question is stored in the system's database. Subsequently, our facial recognition technology will identify a match of people within the data. The person's guardian and the police will be informed if a match is discovered.

The AWS face recognition system, which is based on artificial intelligence (AI), was used in [12] to locate the missing individual. Moreover, the system can utilize the stored image data to identify missing persons, thanks to its capability to retain comprehensive information about individuals who are reported missing. In [13], the authors employ the SWF-SIFT technique to compare two photos, ensuring that 70–80 results are generated based on the image comparisons. This is facilitated through the implementation of User, Police, Complaint Holder, and

Admin modules. Regular updates are made to the database, with redundant data being eliminated. The proposed system enables the efficient and expedited location of specific individuals with minimal time and effort. Within [14], The authors address the challenge of deep face recognition, by proposing the Angular Softmax loss, enabling convolutional networks to learn advanced features with angular characteristics. In [15], they introduce Deep Feature Interpolation, a data is driven approach for processing high in resolution images automatically.

➢ PROPOSED METHOD

A. Classification Algorithm

A classification algorithm that classifies new results from training data is an illustration of supervised learning. A classification program learns from the given dataset into different group. In any situation, classes can be described using targets, labels, or categories. As opposed to a value, the output variable of a classification is a category. Since the is supervised learning, it includes both input and output data, which is why it utilizes labeled input data.

B. KNN Algorithm

The core machine learning algorithm in supervised learning is the K-Nearest Neighbor method. This algorithm operates by correlating the new instance with past data and assigning it to the category that best matches the existing categories.

It maintains all of the previous data so that new data can be categorized on similarities. This demonstrates how fast and accurately the K-NN approach can categorize new data. While it can be applied to regression as well as classification problems, most of its utility is in classification problems.

C. PostgreSQL and Pyqt5

PyQt is a tool for widgets. It was an interface written in Python for the popular and reliable cross-platform Graphical User Interface framework Qt. The Py Qt API consists was multiple mode containing a wide range of groups. It is a Python plugin that implements, which is available as freeware. PostgreSQL, on the other hand, is an enterprise class database that supports both relational (SQL) and non-relational (JSON) querying. The database system has excellent dependability. For numerous online, *mobile.*

D. Methodology

The dlib facial generator, which generates 78 unique point in a face, is used to determine a person's feature points. It makes use of the one-shot learning strategy. The float values at these sites have an accuracy of about 8 values after the decimal. The circumstances are similar to what Fig. 1 depicts.

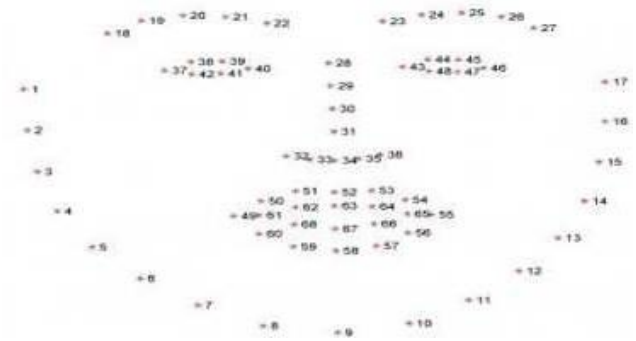

Fig 1. Facial feature identification

Taking into account the three cases that the application reported, dlib would supply (136 * 3) facial landmark points. Since each x and y coordinates will produced, 78 points and 3 scenarios add up to 136 in total (this can be utilized for n cases). Following that, a KNN classifier is trained using these points. Suppose that the KNN distributes the

facial landmark points as depicted in Figure 2, where Person 1 is represented by RED, Person 2 by GREEN, and Person 3 by BLUE.This time, the module will attempt too predict confidence using face landmark that match each people's face by utilizing the KNN classifier that was previously trained. It is considered to be the same person if the degree of confidence is higher than 60%.

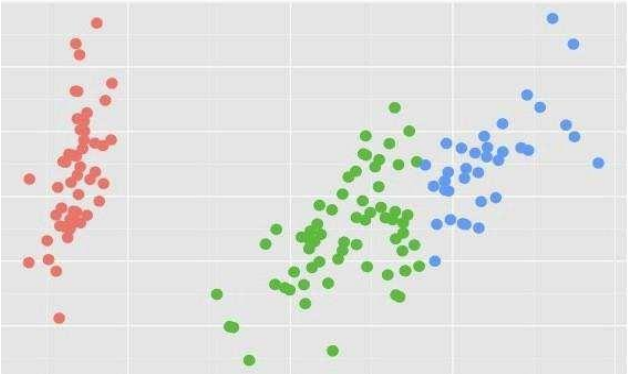

Fig 2. KNN Classifier

the code for KNN Classifier:

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

clf.fit(x, uniqueKeys)
```

Dig 3.

1. N_neighbors: This indicates the number of cases that have been reported. Three examples are kept on record.
2. X - The matrix consist of 3 rows and 140 columns.
3. UniqueKeys - LabelEncoder is utilized to encode a group's subtleties
4. , for example, name and telephone number, with the proper column.

E. Implementation:

Diagram 4 illustrates the operation of the system, which features a simplistic Graphical User Interface and involves straightforward instructions for both administrators and regular users. The system was developed using Python, and the following is a summary of its procedures.

1) Admin Login: To register a new case, the administrator needs to enter their login and password. A postgresql database was selected, and PyQt5 was used to develop the application's graphical user interface.

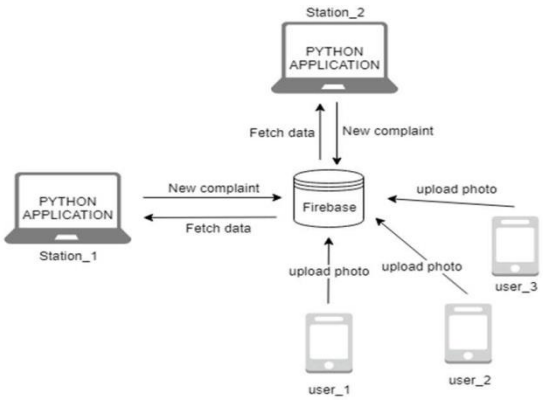

Fig 4. System Architecture

2) When the administrator accesses their account, a new window will appear, allowing them to register new cases. The window provides selection for initiating the new cases, loading the database, comparing existing data in the database, reviewing updated case in database, and verified.

3) people submission: Using a Graphical User Interface, the people provide input information such as name, phone number, location of photo shoot, and image captured. An application for smartphones has been developed that makes it simple for users to capture images whenever and wherever they wish..

4) Matching cases: The next stage involves comparing the user-uploaded image with the case image. The pictures are matched using the KNN approach. To initiate model training, select the refresh opt in the main menu. Upon pressing the match button, the model will proceed to compare both images. Depending on the outcome of the comparison, it will either display "match discovered" or "match not found".

➢ RESULT ANALYSIS

- GUI Application:

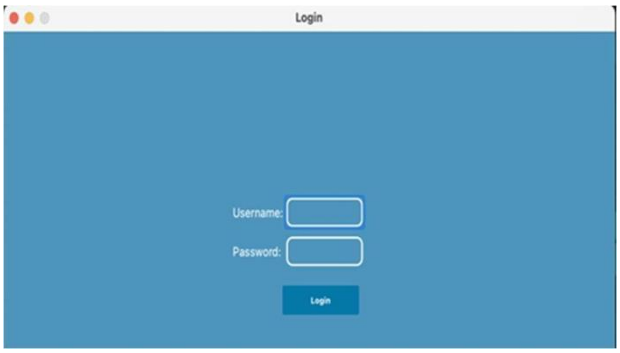

fig 5. Administrator login page

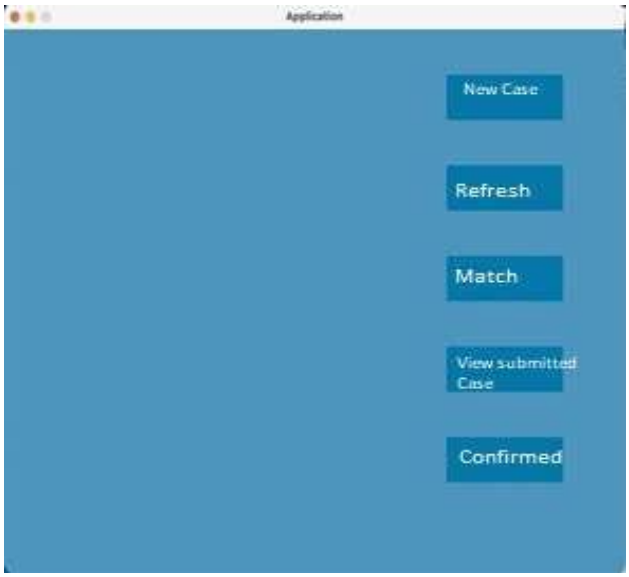

fig 6.Main Application Page

Fig 7. Registering new case page

The administrator accesses the Graphical User Interface by enter login credets as depicted in Figure 5. The application provides functionalities such as adding a new data, refreshing the modules, matching missed children from the database, and viewing data base and Verified cases, as displayed in figure six. When registering the new data is necessary, the administrator clicks on the "New Case" button, triggering the launch of a new GUI that prompts the user for relevant data, as illustrated in Fig 7..

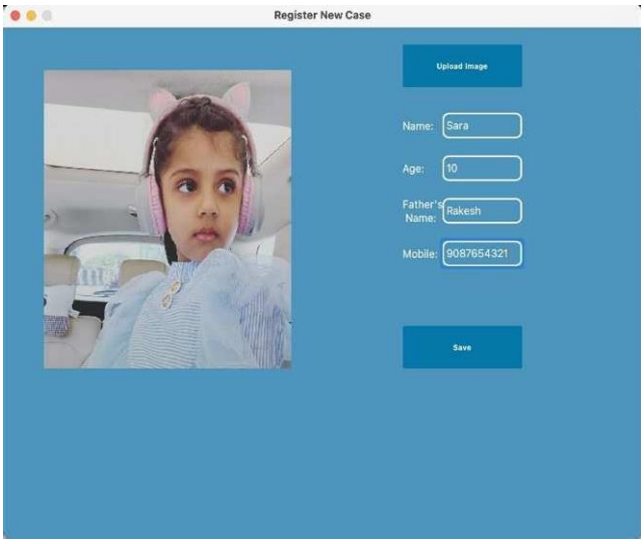

fig 8. Main Application Page Window

Confirm requests: it indicated on Figs. Eight and nine, here is location where all processed complaints will be stored and where submitted cases may be viewed after they have been verified.

Match: All of the user-registered points are downloaded by the trained KNN classifier, which then estimates the value. As seen in Fig. 10, a match is deemed to exist if confidence increases to 60% or above.

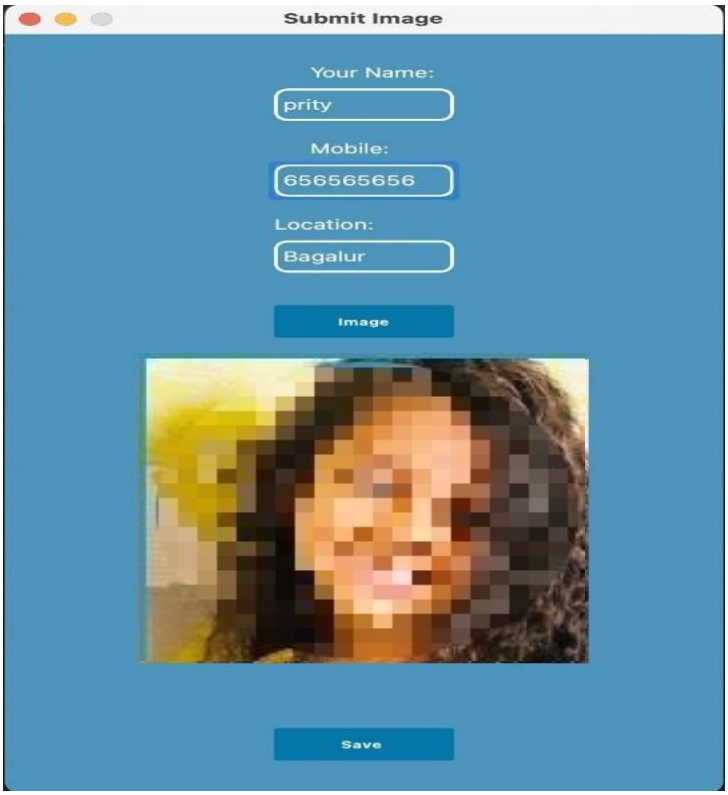

Fig 9. Image Submission

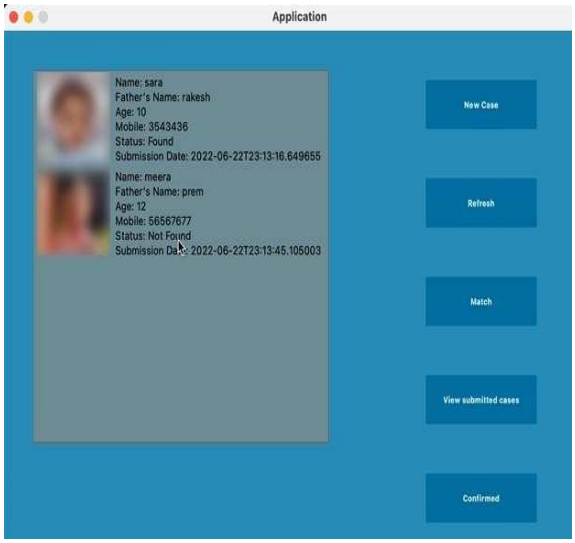

Figure 10. illustrates the process of matching the image to locate the missing individual.

Id	***Function***	***Details***	***% Examination cases Executed***	***% Test Cases Executed***	***pending***
1.	As an administrator, log in.	makes the system accessible to the administrator	Successful	Successful	0
2.	include new cases	Including a data	100%	100%	0
3.	Update.	The module is refreshed and treated.	100%	100%	0
4.	Match	The image that the user uploaded and the case picture that is kept in the database are compared.	100%	100%	0
5.	Review submitted cases.	Take note of a cases an administrator is submitted.	100%	100%	0
6.	Confirmed	The instances that have been resolved are examined.	100%	100%	0
7.	Picture Upload	Users have the capability to upload a photo, which can then be stored in the database for future processing.	100%	100%	0
8.	Mobile application	gives regular users the chance to post a picture and specify their location.	100%	100%	0

➢ CONCUSION

The system is working example of the AI assisted missing Child Lookup. designed to find missing children. In this study, we examine its various features and practical applications. Making it simpler to locate and report missing children was the main objective, and it was accomplished. This technology can be quite helpful if used properly. It may be used to swiftly find offenders even in motels, clinics, and other public areas. Creating APIs using Flask will improve this application significantly. Using Tensorflow, a completely functional web application may also be made.

➢ REFERENCES

[1]. S. Chen, Y. Liu, X. Gao, and Z. Han. Mobilefacenets: Efficient CNNs for accurate real-time face verification on mobile devices. In CCBR, 2020.

[2]. Omkar M parkhi, andrea vedaldi, andrew zisserman, et al, “Deep Face Recognition,” in BMVC, volume 1, page 6, 2020.

[3]. Rohit Satle , Vishnuprasad Poojary , John Abraham , Mrs. Shilpa wakode, “Missing Child Identification Using Face Recognition System” vol.3, issue.1, July – August 2019.

[4]. Sumeet Pate, “Robust face recognition system for e-crime alert”, in International Journal for Research in Engineering Application and Management, Issue 1, MAR, 2O19.

[5]. Peace Muyambo, 2018, An Investigation on the use of LBPH algorithm for face recognition to find missing people inzimbabwe, International Journal of Engineering Research & Technology (IJERT) volume 07, issue 07 (july 2020).

[6]. Bharath Darshan Balar, D S Kavya, Chandana M, Anush E, Vishwanath R Hulipalled, “Efficient Face Recognition System for Identifying Lost People”, International Journal of Engineering and Advanced Technology (IJEAT), volume-8, issue-5s, may 2021.

[7]. Saurabh p.Bahurupi, D.S.Chaudhari,"Principal Component Analysis for Face Recognition," International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, volume-1, issue-5, June 2022.

[8]. Howard, A. G., Zhu, M., Chen, B., Kalenichenko, D., Wang, W.,Weyand, T., Et Al.: Mobilenets: Efficient Convolutional Neural.

[9]. Hsin-rung Chou, Jia-hong Lee, Yi-ming Chan, And Chu-song Chen, “Data-specific Adaptive Threshold For Face Recognition And Authentication”, arxiv.Org, 26 Oct 2018.

[10]. F. Wang, X. Xiang, J. Cheng, And A. L. Yuille. Normface: L2 Hypersphere Embedding For Face Verification. In Acmmm, 2017.

[11]. Shefali Patil, Pratiksha Gaikar, Divya Kare, Sanjay Pawar, “ Finding Missing Person Using AI”, International Journal Of Progressive Research In Science And Engineering, Vol.2, NO.6, Jun 2021.

[12]. Sanskar Pawar, Lalit Bhadane, Amanullah Shaikh, Atharv Kumbhejkar, , Swati Jakkan, “Find Missing Person Using Artificial Intelligence”, International Research Journal of Engineering and Technology (IRJET), Volume: 08 Issue: 12 | Dec 2021

➢ *REFERENCE*

1. Comparing Performance Measure Of Spare Representation On Image Restoration Algorithms
    a) Subramaniam Sakthivel – Department Of Computer Science And Engineering
    Sona College of Technology, India

2. An Efficient Image Retrieval Of Digital Images Using Content Based Image Retrieval By Fuzzy Based Rule Extraction.
    a) Dr.R.C. Narayanan – Department Of Computer Science And Engineering
    Sona College Of Technology, India