
ISSN: 2321-2152
IJMECE
International Journal of modern
electronics and communication engineering
E-Mail
editor.ijmece@gmail.com
editor@ijmece.com
www.ijmece.com

ISSN 2321-2152
www.ijmece.com
Vol 12, Issue 4, 2024
https://doi.org/10.5281/zenodo.14351260

AI-ASSISTED SEARCH FOR MISSING PERSONS USING NATURAL LANGUAGE TOOL KIT AND OPEN CV FACE DETECTION

Marmam Harish[1], Dr. A. Pranayanath Reddy[2]

[1]PG Scholar, Department of CSE, Teegala Krishna Reddy Engineering College (Autonomous Institution),Medbowli, Meerpet, Saroornagar,Hyderabad
[2] Associate Professor, Department of CSE, Teegala Krishna Reddy Engineering College (Autonomous Institution), Medbowli, Meerpet, Saroornagar, Hyderabad

ABSTRACT

The fact that half of the 174 children who go missing each day in India are still unaccounted for is incredibly troubling. According to a National Crime Records Bureau (NCRB) data, more than one lakh children (1,11,569 in all) were reported missing up until 2016, and 55,625 of them were still unaccounted for at the end of the year that was cited by the Ministry of Home Affairs (MHA) in Parliament (LS Q no. 3928, 20-03-2018). In order to tackle and help out Police, AI-Assisted Search for Missing Children a GUI application was created in Python that the police may use to open a new case and find missing children. The missing person's image that has been supplied is processed on the backend, and important information are recorded. This is kept in a database together with more details like name, parent's name, age, place, etc. An application using Android is also developed which can be made accessible to the general public. Using this application, a person's photo can be uploaded if found suspicious by the user. There is an option of submitting the photo obliquely or anonymously. Along with the location, this image is saved in the database. The GUI application applies a machine learning algorithm to compare user-submitted photos with those uploaded by the police. Any matches along with the place where the missing individual was last seen if they are discovered can displayed.

I. INTRODUCTION

The project encompasses providing law enforcement with a robust tool for quickly matching and retrieving data on missing children through a centralized database. It also includes enabling public participation via web application for anonymous photo submissions, thereby increasing the chances of locating

ISSN 2321-2152
www.ijmece.com
Vol 12, Issue 4, 2024
https://doi.org/10.5281/zenodo.14351260

missing children. By integrating machine learning algorithms, the project aims to enhance the accuracy and speed of identifying matches. Additionally, the system incorporates geolocation tracking to map the last known and current sightings of missing children, further aiding in their recovery.

The goal of the project is to develop a system that can identifying the missing persons with web application using python. Machine Learning algorithms are employed for detecting the missing persons. The objective of the project is to develop an AI-assisted system that aids in the swift and efficient recovery of missing children. This system aims to empower law enforcement agencies with advanced tools for data management and photo matching, while also engaging the public in the search process through a user-friendly web application. By leveraging machine learning algorithms and the project seeks to increase the accuracy and speed of identifying missing children, ultimately reducing the number of unaccounted-for cases and reuniting more children with their families.

The project involves developing an AI-assisted system to aid in the recovery of missing children. It consists of two main components: a Python-based GUI application for police use and web application for public use. The police application allows law enforcement to open new cases, process images, and record essential details about missing children in a centralized database. The public application enables users to upload photos of children they find suspicious either anonymously or openly, along with location data. Machine learning algorithms are employed to compare these user-submitted photos with those in the police database. Any matches found are displayed, including the location where the missing individual was last seen. This integrated approach aims to streamline search efforts involve the community, and enhance the overall effectiveness of finding and recovering missing children

II.RELATED WORK

Face recognition using histograms of oriented gradients

Authors: O. Deniz, g. Bueno, j. Salido, and f. D. La torress

Face recognition has been a long-standing problem in computer vision. Recently, histograms of oriented gradients (hogs) have proven to be an effective descriptor for object recognition in general and face recognition in particular. In this paper, we investigate a simple but powerful approach to make robust use of hog features for face recognition. The three main contributions of

ISSN 2321-2152
www.ijmece.com
Vol 12, Issue 4, 2024
https://doi.org/10.5281/zenodo.14351260

this work are: First, in order to compensate for errors in facial feature detection due to occlusions, pose and illumination changes, we propose to extract hog descriptors from a regular grid. Second, fusion of hog descriptors at different scales allows to capture important structure for face recognition. Third, we identify the necessity of performing dimensionality reduction to remove noise and make the classification process less prone to overfitting. This is particularly important if hog features are extracted from overlapping cells. Finally, experimental results on four databases illustrate the benefits of our approach.

Face recognition using sift features

Authors: C. Geng and x. Jiang

Scale invariant feature transform (sift) has shown to be a powerful technique for general object recognition/detection. In this paper, we propose two new approaches: Volume-sift (vsift) and partial-descriptor-sift (pdsift) for face recognition based on the original sift algorithm. We compare holistic approaches: Regularization and extraction (ere)with featurebased approaches: Sift and pdsift. Experiments on the orl and ar databases show that the performance of pdsift is significantly better than the original sift approach. Moreover, pdsift can achieve comparable performance as the most successful holistic approach ere and significantly outperforms flda and nlda.

Missing child identification using face recognition system

Authors: Rohit satle, vishnuprasad, poojary, john abraham and shilpa wakod.

The human face plays an important role in our social interaction, conveying people's identity. Face recognition is a task that humans perform routinely and effortlessly in their daily lives. Face recognition, as one of the primary biometric technologies, became more and more important owing to rapid advances in technologies such as digital cameras, the internet and mobile devices, and increased demands on security. A facial recognition system is a computer application capable of identifying or verifying a person from a digital image or a video frame from a video source. Face recognition system is a computer based digital technology and is an active area of research. This paper addresses the building of face recognition system by using principal component analysis (pca) method. The pca has been extensively employed for face recognition algorithms. It not only reduces the dimensionality of the image, but also retains some of the variations in the image data. The system functions by projecting face image onto a feature space that spans the significant variations among known face images. The significant features are known as "eigen faces", because they are the eigenvectors (principal component) of the set of faces they do not necessarily correspond to the features such as eyes, ears, and noses. The projection operation characterize an individual face by a weighted sum

ISSN 2321-2152
www.ijmece.com
Vol 12, Issue 4, 2024
https://doi.org/10.5281/zenodo.14351260

of the eigen faces features and so to recognize a particular face it is necessary only to compare these weights to those individuals.

Very deep convolutional networks for large-scale image Recognition

Author: Karen simonyan and andrew zisserman

In this work we investigate the effect of the convolutional network depth on its accuracy in the large-scale image recognition setting. Our main contribution is a thorough evaluation of networks of increasing depth using an architecture with very small (3 × 3) convolution filters, which shows that a significant improvement on the prior-art configurations can be achieved by pushing the depth to 16–19 weight layers. These findings were the basis of our imagenet challenge 2014 submission, where our team secured the first and the second places in the localisation and classification tracks respectively. We also show that our representations generalise well to other datasets, where they achieve state-of-the-art results.

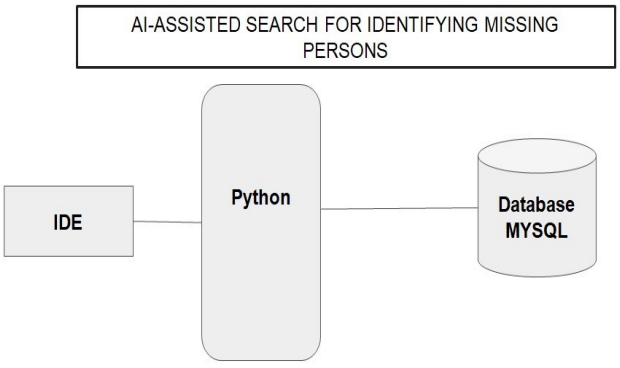

Fig:1 System Architecture

III.IMPLEMENTATION

The "AI-Assisted Search for Missing Children" system consists of several modules that work together to achieve its objectives. Here are five key modules:

1.User Interface Module:

This module encompasses both the GUI application for law enforcement in Python and the Android application for public use. It provides an intuitive interface for users to interact with the system, enabling police to input case details and facilitating public users in submitting photos of suspicious individuals. The user interface module is crucial for seamless communication between the system and its users.

2.Image Processing Module:

The image processing module is responsible for handling and enhancing the quality of the images submitted by both law enforcement and the public. It employs advanced algorithms to preprocess images, ensuring that the machine learning algorithm receives standardized inputs for accurate comparison and matching.

3.Database Management Module:

This module manages the storage and retrieval of data related to missing children, including details provided by law enforcement, images, and information submitted by the public. It ensures the systematic organization of data for efficient querying and analysis, supporting the search for missing children.

ISSN 2321-2152
www.ijmece.com
Vol 12, Issue 4, 2024
https://doi.org/10.5281/zenodo.14351260

4.Machine Learning Algorithm Module:

The heart of the system, this module incorporates machine learning algorithms to compare and match user-submitted photos with those uploaded by law enforcement. The algorithm learns from the data it processes, improving its accuracy over time. This module plays a crucial role in identifying potential matches and assisting in locating missing children.

5.Privacy and Security Module:

Given the sensitive nature of the information involved,the privacy and security module ensures the protection of user data. It encorporates encryption mechanism,access controls,and anonymization features to safeguard the privacy of individuals submitting information. This module addresses ethical considerations and legal requirements associated with handling sensitive information.

These modules work collaboratively to create a robust and integrated system for the AI-assisted search for missing children, combining user interaction, data processing, machine learning, and privacy considerations.

IV.ALGORITHUMS

NLTK

The Natural Language Toolkit, or more commonly NLTK, is a suite of libraries and programs for symbolic and statistical natural language processing (NLP) for English written in the Python programming language. It was developed by Steven Bird and Edward Loper in the Department of Computer and Information Science at the University of Pennsylvania.[4] NLTK includes graphical demonstrations and sample data. It is accompanied by a book that explains the underlying concepts behind the language processing tasks supported by the toolkit, plus a cookbook.

NLTK is intended to support research and teaching in NLP or closely related areas, including empirical linguistics, cognitive science, artificial intelligence, information retrieval, and machine learning.[7] NLTK has been used successfully as a teaching tool, as an individual study tool, and as a platform for prototyping and building research systems. There are 32 universities in the US and 25 countries using NLTK in their courses. NLTK supports classification, tokenization, stemming, tagging, parsing, and semantic reasoning functionalities.

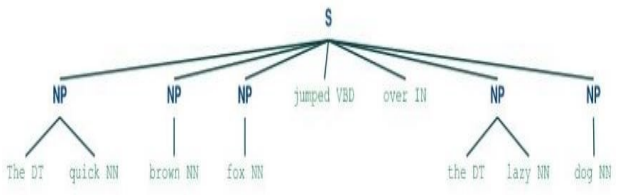

Fig 5.1: Natural Language Tool Kit Haar Cascades:

Haar Cascade is an object detection method used to locate objects on images. The algorithm learns from a large number of positive and negative

ISSN 2321-2152
www.ijmece.com
Vol 12, Issue 4, 2024
https://doi.org/10.5281/zenodo.14351260

samples-the former contains an object of interest, and the latter contains anything other than the object you are Looking for. After training, the classifier can find an object of interest on new images. The method was used in criminal identification in combination with the local binary pattern algorithm to recognize faces. The Haar cascade classifier uses 200 features, which ensures an 85-95% recognition rate even with varying expressions.

The face recognition process is divided into two parts: Face Detection and Face Recognition using Datasets. Face detection is detecting the presence of the face and face location in the image or live video frame. We have used HAAR

Cascade classifier proposed by Viola and Jones to detect faces. The Haar classifier [6] is a machine learning based approach which is trained from many positive images (i.e. images with faces) and negative images (i.e. images without faces). It uses Haar features to extract features from image.

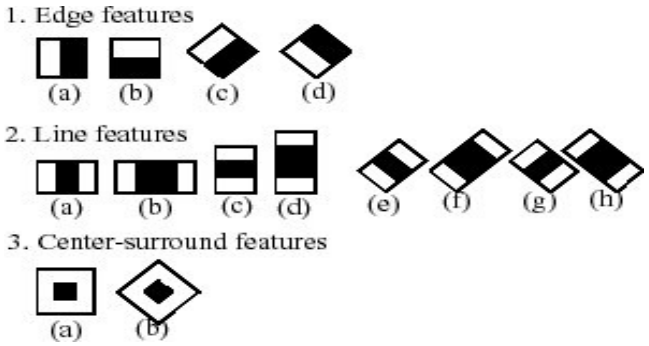

Fig-5.2: Haar-like Features

Shows some of the features of Haar Classifier. Each window is placed on the image to calculate a single feature by subtracting the sum of pixels under white part of window from the pixels under the black part of window. In the end algorithm considers the most important features (i.e. eyes, nose, lips) to detect face.

LOCAL BINARY PATTERNS HISTOGRAMS(LBPH):

This method uses local binary patterns (LBP), a simple, effective texture operator in computer vision that marks pixels in an image by setting each pixel's neighborhood threshold and treating the result as a binary number. At the learning stage, the LBPH algorithm creates histograms for each image and that is labeled and classified. Each histogram represents each image from the training set. This way,the actual recognition process implies comparing histograms of any two images

OPENCV: Open Source Computer Vision Library (OPENCV) is a popular library of computer vision algorithms, image processing, and numerical open source general purpose algorithms.

V.RESULTS AND DISCUSSION

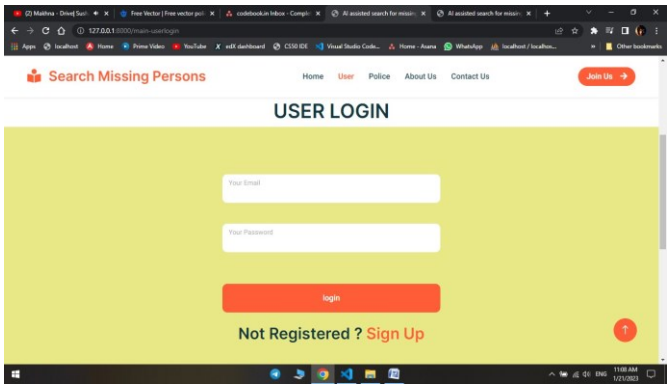

Fig 1,User Login

ISSN 2321-2152
www.ijmece.com
Vol 12, Issue 4, 2024
https://doi.org/10.5281/zenodo.14351260

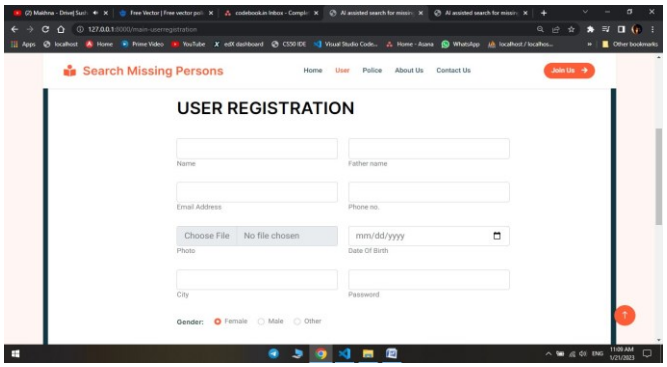

Fig 2 ,User Registration

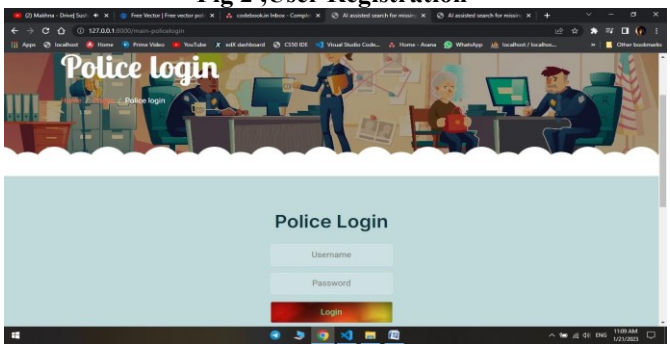

Fig 3 ,Police Login

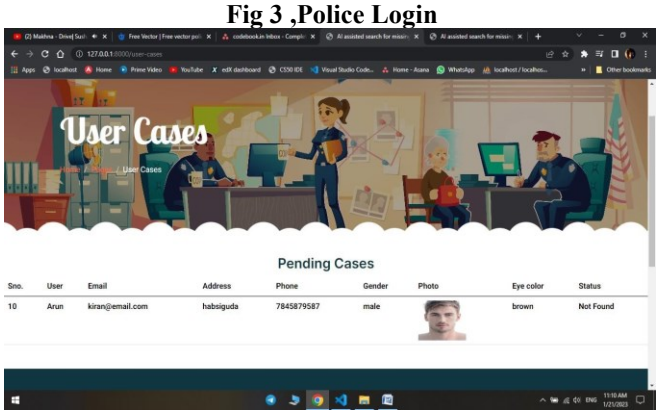

Fig 4,Pending Cases

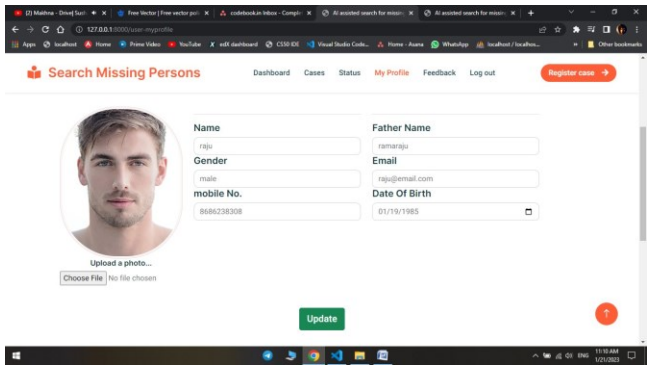

Fig 5,Prediction Data

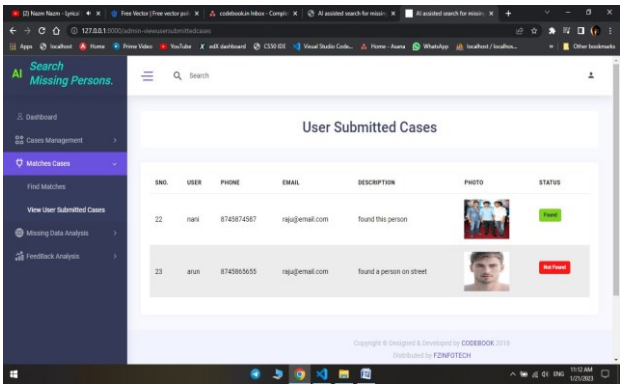

Fig 6,User Submitted Cases

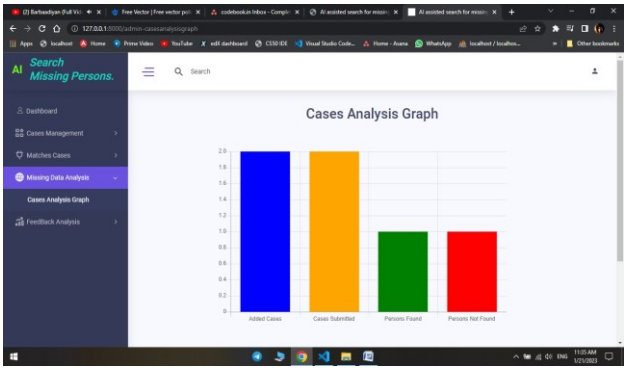

Fig 7, Analysis Graph

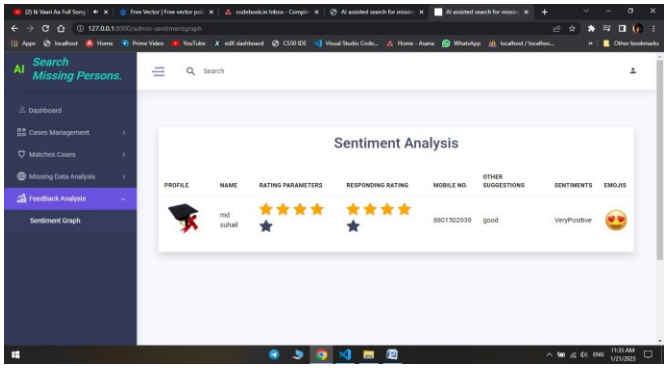

Fig 8,Sentiment Analysis

VI. CONCLUSION

This system is a functioning illustration of an AI-Assisted Search for Missing Children intended to locate missing children. It has several facets and has a variety of useful capabilities, as it's explored in this paper. The primary goal was to make it

ISSN 2321-2152
www.ijmece.com
Vol 12, Issue 4, 2024
https://doi.org/10.5281/zenodo.14351260

easier to find and report missing children, which is successful.

When used wisely, this technology can be quite beneficial. Even in hotels, hospitals, and other public places, it may be utilized to quickly locate offenders. This application can be greatly enhanced by utilizing Flask to develop APIs. A fully functional web application can also be created that uses Tensor-flow.

FUTURE ENHANCEMENTS:

The future scope of the project includes implementing more advanced machine learning algorithms to enhance the accuracy and speed of photo matching, thereby reducing false positives. Real-time updates could be introduced, allowing law enforcement and app users to receive immediate notifications when a potential match is found. The system could be expanded to cover more geographical areas and integrate with international databases, aiding in crossborder cases. Additionally, enhanced security measures would ensure the protection of sensitive data, and user-friendly features could be added to improve the overall user experience for both police and the general public.

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, 2018.

[2]. Omkar M parkhi, andrea vedaldi, andrew zisserman, et al, “Deep Face Recognition,” in BMVC, volume 1, page 6, 2015.

[3]. Rohit Satle , Vishnuprasad Poojary, John Abraham , Mrs. Shilpa wakode, “Missing Child Identification Using Face Recognition System” vol.3, issue.1, July – August 2016.

[4]. Sumeet Pate, “Robust face recognition system for e-crime alert”, in International Journal for Research in Engineering Application and Management, Issue 1, MAR, 2O16.

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

[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 2019.

[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 2012.

[8]. Howard, A. G., Zhu, M., Chen, B., Kalenichenko, D., Wang, W., Weyand, T., Et Al.: Mobilenets: Efficient Convolutional Neural Networks For Mobile Vision Applications. Corr, Abs/1704.04861 (2017).

[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.

ISSN 2321-2152
www.ijmece.com
Vol 12, Issue 4, 2024
https://doi.org/10.5281/zenodo.14351260

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