IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 6, November 2024

Detecting Missing Persons Using Face Recognition

Shobha D S[1] and Dr. Chitra K[2]
Student MCA, IVth Semester[1]
Associate Professor, Department of MCA[2]
Dayananda Sagar Academy of Technology and Management, Udaypura, Bangalore, Karnataka, India
shobhads271@gmail.com and chitra-mca@dsatm.edu.in

Abstract: *In response to the challenge of finding missing people, we developed an advanced facial recognition model integrated with the TensorFlow machine learning platform. Traditional methods are often inefficient and slow, but our innovative solution uses facial recognition technology to optimize the search process. Missing people's facial information is fed into the system, which searches social media, CCTV footage, and public places for matches. Once a match is identified, carers and local authorities are immediately notified, enabling fast and accurate searches. Through advanced algorithms and machine learning, our solutions significantly increase your chances of success while ensuring a high level of privacy and security. Integration with the Django framework provides a powerful and scalable platform that improves the overall effectiveness and efficiency of locating missing people and reuniting them with their families.*

Keywords: Haar Cascade, Facial Recognition, Open CV, Surveillance Footage, TensorFlow

I. INTRODUCTION

Every day, many people go missing and they included children and teen-agers, patient with schizophrenia and other mental disorders, elderly with Alzheimer's disease as well. Of them, most are unsolved till this very day. To regulate the rate of the searches and, respectively, to introduce a new method based on the face recognition. This approach is equally productive for the society as well as the policing bodies. In as much as known that facial recognition has so many applications one if the most crucial ones is in searching for the missing persons. Designing a proper application that suggests the engagement of committed workers in solving the particular issue specified. The above-said system shall significantly minimize the time required in searching the missing persons to a stage where they can be easily identified by the police force. Automating the search is relevant when it comes to the search because the image recognition matches particular images and seeks for a resemblance. This technology confirms that the place provided captured a real picture and has the missing person. Thus, when using face recognition technology in our proposal, the search for missing people is provided by the most efficient means as much as possible. This is also having its advantages especially when it comes to the empowering of the citizens and the police. An important component of our mobile application is the developed within the scope of the Android OS facial recognition algorithm.

1.1 PROBLEM STATEMENT

When stating that a certain person is lost it normally means making a comparison of details that describe any given person were these are images, pieces of clothing or a place they were last seen to details such as, social media posts, security cameras or missing persons' data base. This process involves very big datasets which many a times is difficult to analyze and the process may take a long time. Specifically, the focus of the project is to create the application that would assist in finding people who went missing. In this case, the emphasis is on the sides, the users and those involved with the missing or bereaved persons or individuals. In order to identify the lost people, the Haar Cascade algorithm is used in the proposed research which is one of the simplest and fast schemes that can be used for the target detection in real time which provides the accuracy needed.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 6, November 2024

II. LITERATURE SURVEY

The works of Ess et al present a kind of integration of the visual odometry, pedestrian detection, depth estimation and tracking done with the proponent of cognitive feedback loops for repurposing localization repetitiveness with semantic details. They incorporate failure detection and recovery processes to eliminate the threats of destabilization as evidenced in the literature. The investigations in complex urban videos show that tracking is stable in non-trivial situations [1].

The foundation of the paper written by Aniruddha Dey is the identification of face positions in the frames of the mentioned videos and integrating people into a face recognition system. To achieve it, with the help of the Robert edge detector and the subsequent Gaussian filtering, it finds four corner points that form a facial contour. Movement tracking is defined as distances from these points from one frame to the subsequent [2].

He Guohui et al. continue Yang's face detection theory to start multiple face detection through Gaussian Model and Oval Clustering Model, skin color model and edge detection. This in turn improves the real time data processing, quality and reliability of the data thus the efficiency of the driver fatigue detection [3].

The paper by K. V. Arya et al. describes the surveillance and the auto face detection process through the skin color model in YCbCr & HSV color space. In detection they use the ratio between height and width and next the PCA where the test images are transformed into so called "face space" in order to look for most similar picture [4].

The tracking system based on sparse and discriminative hashing is presented Lihe Zhang, et al. Some of them use the idea of nearest neighbor search in the binary space: concerning the objects, the tracking procedure is invigorated by hash functions where the object is tweaked in a way that strengthens the overall computational method. second, by applying the inter and intra class covariances at respectively the classification step and at the tracking of its motions, their attitude improves the classification [5].

Baxter et al. explains a tracking method when the quality of the environment is low using head- pose-based instantaneous priors. In estimating the motion along the axes, the subjects employ the motion data and currently perceived direction of the gaze wherein they supplement the Kalman Filter. While used in this work to improve the tracking accuracy, particularly for the case of pedestrian tracking, this approach can be employed in the same way for any other prior type [6].

With reference to what has been elaborated in this paper by authors Pranti Dutta et al. the filed format helps in comparing the attained results for the single face detection of stored videos. Similar to what the homemade and ready-made datasets do is study detection percentages on such formats as, wmv, m4v, asf, mpg, 3gp, avi, mov. The following are the steps which are shown in mp4 format as used in the evaluation of the performance of a system organization [7].

III. METHODOLOGY

The development methodology of the "Detecting missing persons" is a meticulously planned and comprehensive approach that amalgamates cutting-edge technologies to forge a potent tool dedicated to the expedited location of missing individuals. The primary objective of this project is to enhance and streamline the search process by incorporating sophisticated machine learning algorithms and facial recognition techniques seamlessly embedded within a web-based framework.

3.1 PROPOSED SYSTEM

When clients upload images or videos, our system initiates image processing. This involves converting the input into a format optimized for our chosen algorithm, Haar Cascade. Haar Cascade specializes in detecting specific objects, such as faces, by focusing solely on those features and excluding irrelevant elements from the image or video frame. Once a face is successfully detected, the next step is face prediction. This phase utilizes data from our database to find a match using the efficient Haar Cascade algorithm. When a match is found, the result is displayed; otherwise, no response is given. Haar Cascade and Convolutional Neural Networks (CNNs) both serve for object detection but employ different approaches. Haar Cascade relies on a machine learning technique that uses Haar-like features to identify objects. It trains a classifier on positive and negative samples of the object to detect similar regions in new images. This method is computationally efficient, making it suitable for real-time object detection tasks.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 6, November 2024

In contrast, CNNs are deep learning models that directly learn features from data. They consist of layers that perform convolution and pooling operations to extract features, followed by a classification layer. CNNs excel in detecting objects with complex variations in appearance or shape, offering higher accuracy but requiring more computational resources and extensive training data. Ultimately, the choice between Haar Cascade and CNNs hinges on the specific needs of the application. Haar Cascade is preferable for real-time applications where efficiency is crucial, whereas CNNs are advantageous for tasks demanding high accuracy despite their higher computational demands.

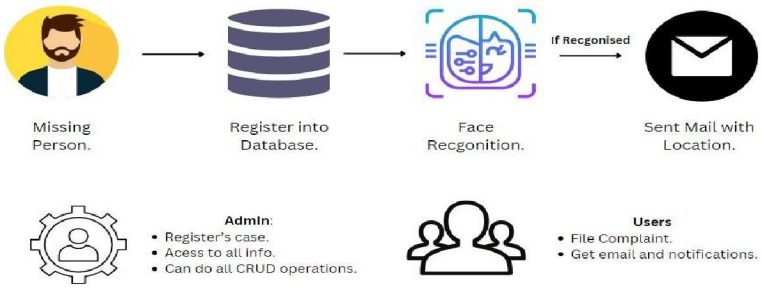

Figure 1 Project Model

3.3 DATA FLOW DIAGRAM

A Data Flow Diagram (DFD) visually maps out the movement of data within a system. It shows how data is entered, processed, and output, detailing the interactions between various components. Using specific symbols for processes, data stores, data flows, and external entities, DFDs offer an intuitive way to grasp how information flows through the system. For the "Detecting Missing Persons" application, a DFD would clearly depict the processes, data sources, and the interactions between different elements, providing a clear picture of how data moves and is managed within the system.

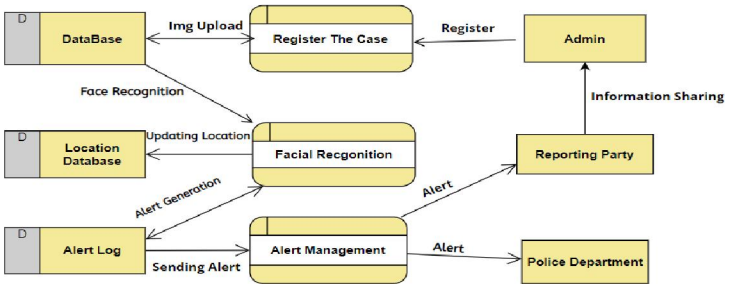

Figure 2 Data Flow Diagram

3.4 HAAR CASCADE CLASSIFIER

Haar Cascade is a technique developed by Viola and Jones in 2001 for detecting objects like faces in images and videos. It works by breaking down an image into smaller parts and analyzing the contrast in those areas. These parts, called Haar-like features, are rectangular sections of varying light and dark patterns.

The algorithm operates in four main steps:

1. Calculating Haar Features: It identifies these specific patterns within the image.
2. Creating Integral Images: This preprocesses the image to speed up feature calculation.
3. Using Adaboost: It combines weak classifiers to form a strong classifier for more accurate detection.
4. Implementing Cascading Classifiers: This organizes the classifiers into stages, where each stage filters out areas of the image that are unlikely to contain the object, optimizing performance. Implementing Cascading Classifiers

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 6, November 2024

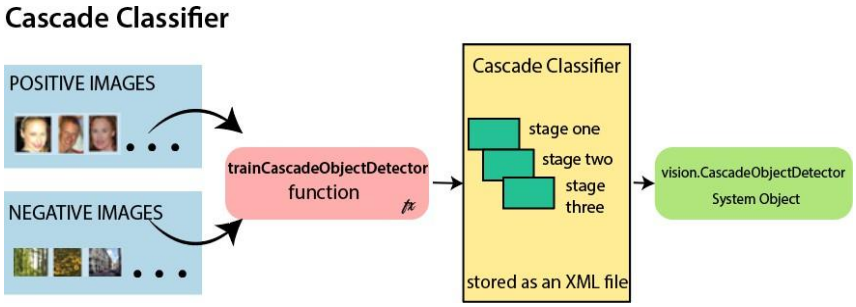

Figure 3 Cascading Classifiers

A cascade classifier also consists of many stages and each of the stages contains many weak learners. These weak learners, trained through boosting, provide the forecast of their outcomes in order to come up with an accurate classifier based on their own opinions. When implementing the image, the classifier evaluates the areas with the aim of determining if the object exists, which is positive, or if it does not exist, which is negative, and if the case is the latter, it jumps to the next. More importantly, the stages are designed for such a quick rejection of negative samples since most of the areas will not contain the object of interest. On their part, false negatives where an object is classified as a non-object should be eradicated to the extent possible since they are very poisonous to the identification of objects.

IV. CONCLUSION

Our system utilizes advanced facial recognition and one-shot learning to swiftly identify missing persons. Integrated with public cameras, it compares new images with database entries in real-time. Upon detecting a potential match, authorities are promptly alerted, expediting rescue efforts. This automation replaces manual searches, enhancing efficiency and public involvement in finding missing individuals. By employing the Haar Cascade algorithm for robust face detection and classification, our approach ensures accurate identification even as appearances change over time.

REFERENCES

[1]. Andreas Ess, Bastian Leibe, Konrad Schindler, Luc Van Gool, “A Mobile Vision System for Robust Multi-Person Tracking” 2008 IEEE.
[2]. AniruddhaDey, “A Contour based Procedure for Face Detection and Tracking from Video” 3rd Int'I Conf. on Recent Advances in Information Technology I RAIT-20161.
[3]. He Guohui,WangWanying, “An algorithm for fatigue driving face detection and location” 2015 8th International Conference on Intelligent Computation Technology and Automation.
[4] K. V. Arya, AbhinavAdarsh, “An Efficient Face Detection and Recognition Method for Surveillance” 2015 International Conference.
[5]. Lihe Zhang, Huchuan Lu, Dandan Du, and Luning Liu, “Sparse Hashing Tracking” IEEE TRANSACTIONS ON IMAGE PROCESSING, VOL. 25, NO. 2, FEBRUARY 2016.
[6]. Rolf H. Baxter, Michael J. V. Leach, Sankha S. Mukherjee, and Neil M. Robertson, “An Adaptive Motion Model for Person Tracking with Instantaneous Head-Pose Features” IEEE SIGNAL PROCESSING LETTERS, 2015
[7]. S. PrantiDutta, Dr.Nachamai M, Department of Computer Science, Christ University Bengaluru, India “Detection of Faces from Video Files with Different File Formats”.