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Smart Attendance using Face Recognition

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Abstract— Every institution, college, and company, no matter how big or little, has a method for recording attendance. Due to the latter's ability to simplify the former, we have developed a method. enormous developments in the area of image processing.Face More people are choosing recognition over other biometrics. due to its ease of use, non-intrusiveness, and lack of touch, and. The system's main objective is to recognise and real-time environment, detect faces, and link them with register their attendance and enter their data in the database. Here is intended to streamline the laborious manual attendance more effective method. This also resolves the problem of Since biometrics are unique, and the facial characteristics used for Face Recognition are one of them. Because biometrics are unique, including the facial features utilised for Face Recognition, this also solves the authentication and proxy issues. The designed system employs OpenCV, dlib, Face Recognition libraries, and One-Shot Learning for face detection and recognition. One-Shot Learning only stores one image per person in the database, saving space in comparison to traditional training-testing models.

.Keywords— face recognition, image processing, face detection, opencv, dlib, training, testing

I. INTRODUCTION

In this current era of automation, numerous scientific breakthroughs and technologies have been developed to save time, increase accuracy, and cut expenses to improve the quality of our lives. Automation is the breakthrough that has been made in the realm of traditional jobs, and it will eventually replace them. Send a message to one presence. helper technology These systems frequently use biometrics. data that is both web-based and smart card-based These Systems are frequently used in a range of enterprises. The following formula is used to determine attendance time traditionally: When the strength is lacking, it takes a lot of time and effort. Because it saves time and can be used for security, the automated attendance system offers an advantage over the traditional approach. Additionally, it helps to prevent providing incorrect guidance. a sophisticated method for tracking attendance The use of bio metrics, which is expensive in our case, often entails database management and image acquisition. Face detection, preprocessing, and feature extraction and classification stages of development The post-processing stage is then finished.

Techniques for machine learning are employed. On paper, we may record automatic attendance. To build this model, convolutional neural networks are utilised. Classroom face recognition software

The occurrence and absence of the occurrence and absence of the occurrence and absence of the The student will be informed if they get a message.

II. EXISTING SYSTEM

Facial recognition software can be used to register presence by comparing a student's face to one that has already been detected by a high-resolution digital camera. The database includes pictures of faces. as soon as the student's face matches the one in the database-stored snapshot. Your

presence is noted in the attendance database for the purpose of a calculation later on. If the photograph you took isn't quite perfect or doesn't match the kids' faces, a fresh photograph is saved in the database, the repository of data. With this approach, there is a chance that the picture won't be properly taken by the camera or that you'll miss the chance to photograph a few kids..

III. PROPOSED SYSTEM

We used the LBPH face recognition algorithm along with the Haar Cascade face detection technique in this proposed automatic attendance management application. The Python module Tkinter package, which is a quick and simple approach to develop a GUI system, was used to generate the Graphical User Interface (GUI) screen for this programme.

The programme will include features like photographing pupils, recording their student ID, name, and phone number in the database, training the photographs recorded there, and starting to recognise students who are in the classroom. The programme will analyse the faces of the pupils in the classroom from the webcam when the teacher needs to record their presence before further identification. The system is made out of a camera that records the employee's images and delivers them to the image improvement module. Following image enhancement, the image enters the Face Detection and Recognition modules, whereupon the database server records the attendance. The experimental set-up in Figure demonstrates this. Templates of each employee's face photos are saved in the Face database at the time of enrollment. Here, the algorithm finds every face in the input image and compares it one by one to the face database. If any face is identified, the attendance is noted on the server, which is accessible to anybody and can be used for a variety of purposes. Admins can take pictures of the office or The front of the building can be equipped with a camera, which can take pictures and subsequently identify faces based on a trained model. Then, identified faces are designated as current individuals.

A. System Architecture

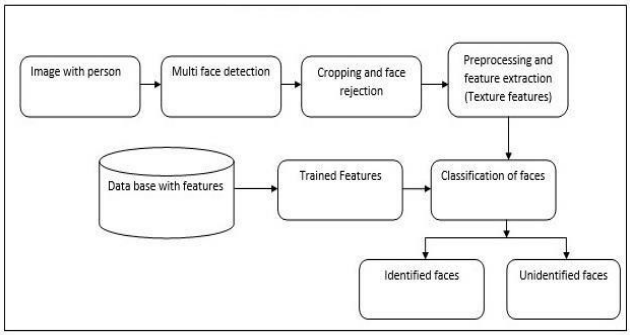

Fig. 1 System Architecture

B. Feasibility

This project is being developed in the open source Python language. The well-developed OpenCV technology will be used. The hardware and software needed for the project are not particularly difficult to utilise.

System deployment requires a camera and a standard laptop system.

C. Algorithms

Haar Cascade Classifier

We'll use the Haar Cascade classifier to put our use case into practise. Paul Viola and Michael Jones' successful object detection method, the Haar Cascade classifier, was developed.

In order to better grasp these Haar Cascade Classifiers, let's attempt. This method essentially uses machine learning, where a cascade function is learned using a large number of both positive and negative images. It is then used to detect the things in the other images based on the training.

They are large individual.xml files with numerous feature sets, and each.xml relates to a very specific kind of use case, which is how this works.

In this use-case, we'll use the haarcascade frontalface default.xml to try and identify people's faces.We scaled down the image's dimensions for better output because the original image's dimensions were quite enormous.

IV. CONCLUSIONS

The goal of the automated attendance system is to decrease the errors that frequently occur with the conventional (manual) attendance taking system. The goal is to automate and create a system that is beneficial to the institution or other organisation. The modern, accurate method of taking attendance in offices that can replace the traditional, manual ones. This approach is workable, trustworthy, and sufficiently safe. The system can be installed in the office without the use of specific hardware. A camera and computer can be used to create it.

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