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FACE ATTENDANCE SYSTEM

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Abstract

In the post-pandemic environment, the benefits of facial recognition attendance systems have drawn a lot of attention. In the present era, everything has gone contactless, including financial transactions and education. Even automated attendance systems have advanced, offering time savings and convenience. Referring to its most recent iteration, the facial recognition system, it has never been simpler to record attendance. Employees can now record their daily attendance while they're on the go. Both big and small firms are interested in the face recognition attendance system. It is not unexpected that these systems are being utilized in workplaces and company complexes more frequently because they provide so many advantages to both employers and employees.

Keywords

Face detection , Face recognition , Attendance system , AI attendance system , Realtime attendance

I. INTRODUCTION

The human face plays a vital role in our daily lives, mainly for identifying a person. Face recognition is a component of biometric identification, which extracts the facial characteristics of a person, and then stores them as unique face prints to identify a person uniquely. Biometric face recognition has attracted the interest of many researchers due to its wide-reaching applications. Face recognition technology outperforms other biometric based identification methods such as fingerprint, palm, iris, etc., because of the non-contact process of recognition. Recognition techniques based on face recognition can also identify a person at a distance, without contact or interaction with them. Currently, face recognition technology is used in social media websites such as Facebook, at airports, railway stations, and at crime investigations. A face recognition technique can be used in crime reporting by capturing a captured photo and storing it in a database to identify a person.

Facebook uses facial recognition technique to automate the tagging process. In order to identify a face, we need a large data set and complex features. We need to be able to identify a face in all conditions such as change of lighting, age, poses, etc. The recent researches show that facial recognition systems have improved a lot in the last decade. There have been huge advances in recognition techniques in the past decade. However, at present, most of facial recognition techniques work well only if there are very few people in the frame and under controlled lighting, proper position of face and clear images are used. To identify different subjects uniquely by manipulating various obstacles such as illumination, pose, and aging, we need large data sets, complex features and non-blurring

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images. At present, most facial recognition systems work well with limited number of faces in frame. These methods have been tested in controlled lighting, proper face pose and non-blur images. The system that is proposed for face recognition in this paper for attendance system is able to recognize multiple faces in a frame without any control on illumination , position of face.

It is a technology that can identify or verify a person from a digital image and has emerged as an attractive solution for identity verification. With the increased use of image capturing devices such as smartphones and CCTV cameras, the need for computational analysis of multidimensional facial structures has become more important. The face recognition-based attendance system is an automated solution developed to address issues related to manual attendance-taking, which is time consuming and prone to errors. In educational institutions, attendance is a critical part of daily classroom evaluation, but teachers may miss students or record multiple entries.

This leads to data inconsistencies, which can be resolved with the face recognition based attendance system. The objective of this paper is to offer a simple and automated system for recording and tracking student attendance using biometric technology. The system compares the face of the person with the images stored in the dataset to mark attendance. This paper aims to make the attendance process faster and more accurate. The documentation includes the definition, objective, design, implementation, testing, and future enhancements of the paper. The manual attendance system is time consuming and requires lecturers to collect, verify and manage student records. In contrast, the automated system offers better benefits and reduces the workload of the lecturer.

4. PROPOSED WORK

This paper examines various attendance and monitoring tools currently used in the industry, which are mostly automated but are still prone to errors. A new attendance system that combines state-of-the-art methods and advances in deep learning is proposed. The system utilizes a smaller number of face images and a proposed method of augmentation to achieve high accuracy.

Automated Face Recognition has revolutionized the way attendance is taken, making it a more secure and efficient process that reduces paper usage and manual effort. The system captures and stores students' facial biometrics, using various algorithms and techniques, and recognizes the student when their data is stored, marking their attendance.

The proposed system uses the OpenCV library, which offers a comprehensive set of classic and state-of-the-art computer vision and machine learning algorithms for detecting
and recognizing faces, identifying objects, and more.

The proposed system employs the Fisher face method for face recognition, which is superior and faster than other algorithms, and is also resilient to lighting conditions. Additionally, the Local Binary Pattern Histogram (LBPH) algorithm is a simple solution for face recognition that can detect both front and side faces.

The Software Requirement Specification (SRS) is aimed at defining the necessary functionalities and Uniform Resource Locator (URL) for the Intelligent Network Backup Tool. It intends to establish a clear understanding of the final product's features and specifications as envisioned by both the development team and the client. The requirement statements are prioritized and detailed in this document. It targets project developers, managers, users, testers, and documentation writers, providing them with information on design and implementation constraints,

external interface requirements, system features, nonfunctional requirements, and dependencies. Identifying needs is crucial for businesses and organizations to evaluate their market performance and maintain a competitive edge.

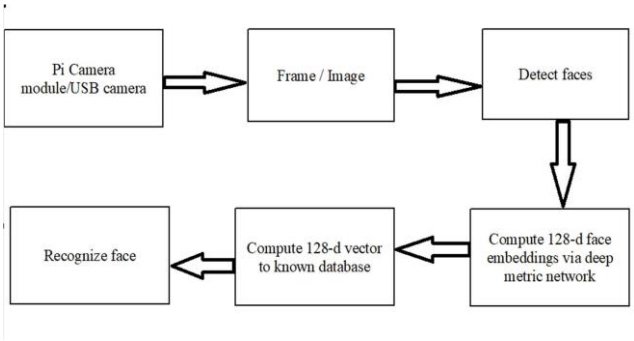


Figure 1 : Face recognition diagram

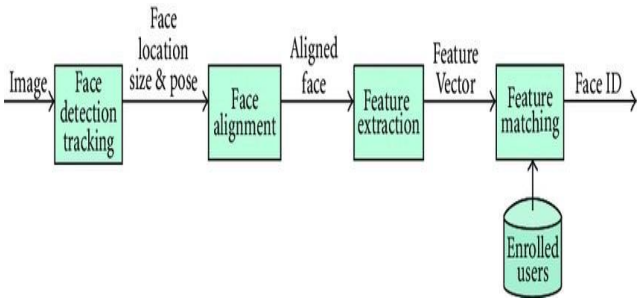
5. DESIGN OF PARTS

1. OpenCV:

OpenCV is a huge open-source library for computer vision, machine learning, and image processing. OpenCV supports a wide variety of programming languages like Python, C++, Java, etc. It can process images and videos to identify objects, faces, or even the handwriting of a human. When it is integrated with various libraries, such as Numpy which is a highly optimized library for numerical operations, then the number of weapons increases in your Arsenal i.e whatever operations one can do in Numpy can be combined with OpenCV. This OpenCV tutorial will help you learn the Image-processing from Basics to Advance, like operations on Images, Videos using a huge set of Opencv-programs and projects.

2. Django :

Django is a Python-based web framework that allows you to quickly create efficient web applications. It is also called batteries included framework because Django provides built-in features for everything including Django Admin Interface, default database – SQLlite3, etc. When you're building a website, you always need a similar set of components: a way to handle user authentication (signing up, signing in, signing out), a management panel for your website, forms, a way to upload files, etc. Django gives you ready-made components to use and that too for rapid development.



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3. SQLite:

SQLite is an in-process library that implements a self-contained, serverless, zero configuration, and transactional SQL database engine. It is a popular choice as an embedded database for local/client storage in application software such as web browsers. It is also used in many other applications that need a lightweight, embedded database.

6. CONCLUSION

The last 20 years have seen significant advancements in face recognition technology. Machines may now automatically confirm identity for safe transactions, security and surveillance duties, building access management, and other applications. These applications are typically used in controlled situations, where high recognition accuracy can be achieved by taking use of environmental constraints in the recognition algorithms. However, in smart environments—where computers and other machinery resemble helpful assistants—next generation face recognition systems will be widely used.

In order to accomplish this, computers must be able to accurately recognize humans in the immediate vicinity in a way that blends in with the typical interactions between people. They have to follow human intuition on when recognition is appropriate and not necessitate any extra interactions.

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