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ABSTRACT

Institutions may improve the student experience in a variety of ways, both basic and sophisticated, with the use of a facial recognition technology. A face is utilized as an index of identification and may be used to identify students and complete tasks without the need for pupils to act or make a gesture. A student is not required to sign a document, swipe a card, or input a key code. Automatic student recognition and database insertion are also possible with integrated camera systems. This may be done quickly for every student present in a busy lecture hall, and in the event of accounting for all students present in a class. The Face-Recognition Attendance System is a replacement for the conventional technique of recording attendance. The suggested system is backed by a MySQL database and is based on Python, Machine Learning, Flask, or Microsoft SQL Server. A single faculty system of a certain institute may use this method. Every organization requires mandatory attendance. Daily attendance registration maintenance is a challenging and time-consuming activity. Several automated techniques are available for the same, including biometric, RFID, eye detection, speech recognition, and many more.

INTRODUCTION

Every firm needs an attendance system to keep track of students' and employees' attendance. They have a unique way to do the same thing. Both manual and automatic attendance systems are used by some. Pen and paper are included in the manual approach, which is time- and resource-intensive. Human mistake and proxy risk are additional concerns. The automated attendance system uses several techniques, such as:

The biometric system uses voice, iris, and fingerprint recognition. Systems for biometric authentication are not always accurate. False acceptance and false rejection are two mistakes that can result in fraud.

One of the best methods for identifying persons now in use is face recognition. It may be employed in educational institutions, workplaces, or other settings. An automated attendance system that is quick and less likely to detect fraudulent attendance is required to avoid the challenges associated with taking the attendance of huge numbers of people. This technological solution is designed to implement a quick and secure method of recording attendance. By continually identifying employees' or students' faces as they enter the classroom via a camera, this attendance is recorded. The computer program first recognizes the faces and then compares them with the specified database.

LITERATURE SURVEY

A real-time computer vision algorithm in an automated attendance management system is one possible technique to build this project. The system deployed a non-intrusive camera in the classroom that could take pictures, and it matched faces stored inside the system with faces extracted from the photos the camera captured. The machine learning algorithms that are often utilized in computer vision were also utilized by this system. This technique primarily uses object detection to find faces in still photos or moving videos.

In this study, a machine learning strategy has been used to apply the concepts of two technologies, namely the student attendance and feedback systems. This system automatically assesses student performance and keeps track of their attendance and evaluations in several topics, including Science, English, and others. As a result, by identifying the face, the student's attendance may be obtained. Upon identification, information regarding the student's attendance and grades is acquired as feedback.

According to the Automatic Attendance System utilizing Face Recognition proposal, the system is built on algorithms for face detection and recognition that are used to automatically recognize students as they enter the classroom and record their attendance by identifying them.

SYSTEM OVERVIEW

The haar-cascade technique and OpenCV are used by this system to perform research and identify faces.

The following are the major components of this technology:

A) Face-Detection.

B) Face Recognition

A. Face detection is another technique that is used in a variety of applications to recognize human faces in digital footage. Face detection is the term used to describe the psychological process through which people identify and pay attention to faces in a visual situation. A particular instance of object-class detection is face detection. The goal of object-class detection is to find the positions and dimensions of every item in an image that fits into a specific class. Examples include taller torsos, people walking, and automobiles. Face-detection algorithms concentrate on identifying human frontal faces.
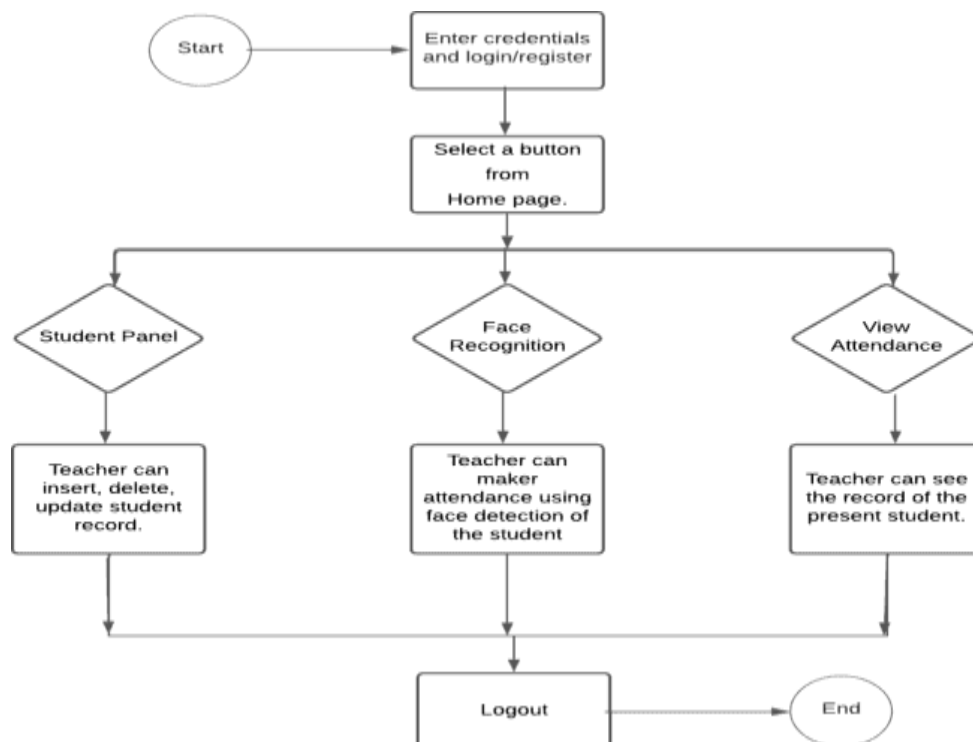
B. Face Recognition: A face recognition system is also a computer programme that can identify or add someone to a digital image or a video frame from a video offer. Examining the chosen countenance based on the image and face data is one of the ways to change the present. It is constantly used in security systems and is contrasted with entirely unrelated fields of life science like fingerprint or iris recognition technologies. Certain face recognition systems validate a countenance by identifying landmarks or choices in a face picture. For instance, the relative location, size, and/or variation of the eyes, nose, cheekbones, and jaw may be examined in an associate degree formula. These selections are then utilized to look for further material that matches the selections. Several methods normalize and compress a collection of face videos, preserving just the information necessary for face identification inside the image. The facial information is then compared to an exploration image. One of the earliest productive arc systems uses guide matching methods on a collection of prominent faces to create a variety of compressed face illustrations.

METHODOLOGY

The OpenCV library is used by the suggested system. It is a free open-source computer vision library that may be used for both commercial and academic purposes. It supports Windows, Linux, Macintosh, iOS, and Android and provides interfaces in C++, Python, and Java. It focuses heavily on real-time applications. More than 2500 efficient algorithms are included in the collection; these algorithms may be used to find items, recognize faces, and more. For face recognition, OpenCV includes a class library called Face Recognizer. This uses the command line or Python to identify and alter faces. It is a cutting-edge facial recognition library created using deep learning that is relatively straightforward. A cross-platform, open-source software library called the dlib is used on a variety of computing systems. The model has a 99.38% accuracy rate. This gives you access to a straightforward command-line face recognition program that enables you to recognize faces from a folder of photographs.

Before the recognition procedure, a database of students is built, which contains a single photograph of each student. Using the admin panel, the recognized teacher performs this. The student's name and their parent's email address will both be entered by the administrator at the same time. A database of all the kids will be established in an excel sheet following the use of a camera to capture photographs.

Activity Diagram-

The key component of the suggested system is face recognition. The instructor will turn on the camera as the kids enter the room, and it will continually identify and recognize faces. An excel file containing the attendance of the class along with the date is prepared after identifying every student who was present in the class.

PROBLEM STATEMENT

The daily evaluation of the classroom heavily weighs attendance .By utilizing face recognition technology based on high definition monitor video and other information technologies, face recognition-based attendance systems may address the issue of identifying faces for collecting attendance. The goal of face recognition is to enable computers to quickly and accurately locate and identify human faces in pictures and movies. Deep learning has recently received a lot of attention for computer vision applications. Many faces may be quickly and automatically detected and recognized by the human brain. Nonetheless, it is exceedingly difficult for a machine to perform all the complex tasks at a human brain level. Biometrics includes facial recognition as a key component.

PRODUCT SCOPE

Facial detection in real time is o ne of the best qualities of a biometric face attendance system is its ability to identify faces in any live video stream, even from difficult angles or in poor light.

The discovered faces from hundreds of employees in the database may also be swiftly identified and processed by the system.

Moreover, AI-based face recognition systems are adept at identifying many faces in a single camera field of view and comparing them to previously captured facial photos that are kept in databases.

SOFTWARE DESCRIPTION

Haar-Cascade Algorithm-

No matter where they are in the image or how big they are, objects may be found using the process known as the Haar cascade. This algorithm can operate in real-time and is not overly complicated. A haar-cascade detector may be trained to recognize a variety of items, including automobiles, bikes, structures, fruits, etc. The use of Haar Cascade classifiers for object detection is efficient. Fast Item Detection using a Boosted Cascade of Basic Features is the paper that Paul Viola and Michael Jones wrote that first described this technique. The classifier is trained using a large number of both positive and negative pictures in the Haar Cascade technique, which is based on machine learning.

OpenCV-

Open CV (Open-Source Computer Vision Library) is a machine learning-focused open-source computer vision software library. Open CV was created to support computer vision applications and encourage the use of artificial intelligence in produces that are economically feasible. Open CV is a product with a BSD license that is simple to use and modify the code for These algorithms can be used for a variety of tasks, including the recognition and detection of faces, the identification of objects, the extraction of 3D models of those objects, the creation of 3D point clouds from stereo cameras, the stitching together of images to create high-resolution images of entire scenes, the removal of red eyes from flash-taken photos, the tracking of eye movements, the recognition of scenery and the establishment of markers to overlay it with intensities, the extraction of 3D models of those objects, the identification of objects

Pandas-

An open-source Python library called Pandas offers a variety of capabilities for data analysis. The package includes a number of different data structures that may be applied to a wide range of data manipulation applications. It also contains a variety of data analysis algorithms that may be used, making it possible to solve data science and machine learning issues with Python.

Idle-

The integrated development and learning environment for Python is known as IDLE. IDLE is entirely written in Python and makes use of the tkinter GUI toolkit. It functions almost consistently on Windows, Unix, and macOS. It contains an interactive Python interpreter with a shell window that can colorize error messages, code input, and code output. Multiple undo, Python colorizing, smart indent, call hints, auto completion, and other capabilities are available in a multi-window text editor. It is able to search across numerous files, replace text within editor windows, and search within any window. Moreover, it contains browsers, setup, and other dialogues.

Microsoft Excel-

The Microsoft Office software package includes the spreadsheet tool Microsoft Excel. Spreadsheets provide rows and columns of numbers that may be numerically modified using both simple and advanced arithmetic operations. In addition to its usual spreadsheet functions, Microsoft Excel also has significant graphing and charting capabilities, programming support through Visual Basic for Applications (VBA), and the ability to retrieve data from

other sources through Dynamic Data Exchange (DDE). Excel, an application for creating electronic spreadsheets, may be used to organize, modify, and store data. Paper spreadsheets used for accounting purposes served as the foundation for early electronic spreadsheet systems.

RESULT ANALYSIS

The Smart Attendance System's user interface has been developed. Individual student photos are being captured and saved in the training dataset via the interface. Their data is simultaneously kept in the database, which is an excel sheet. Ultimately, tracking and identification of the student photographs has been completed.
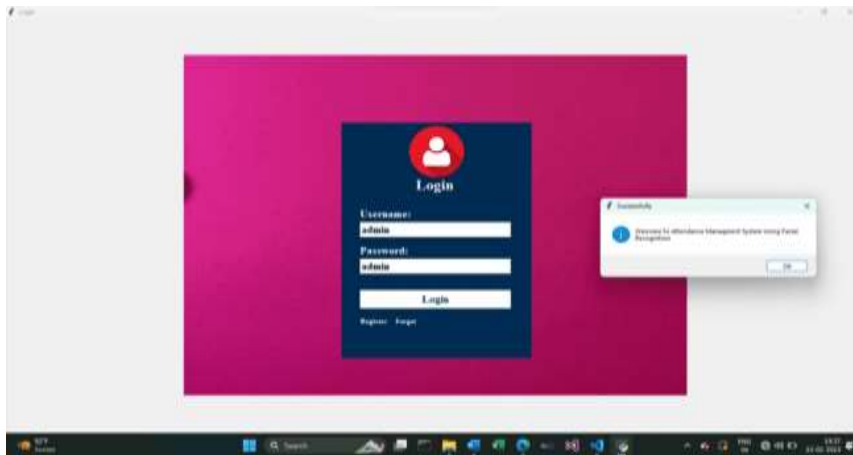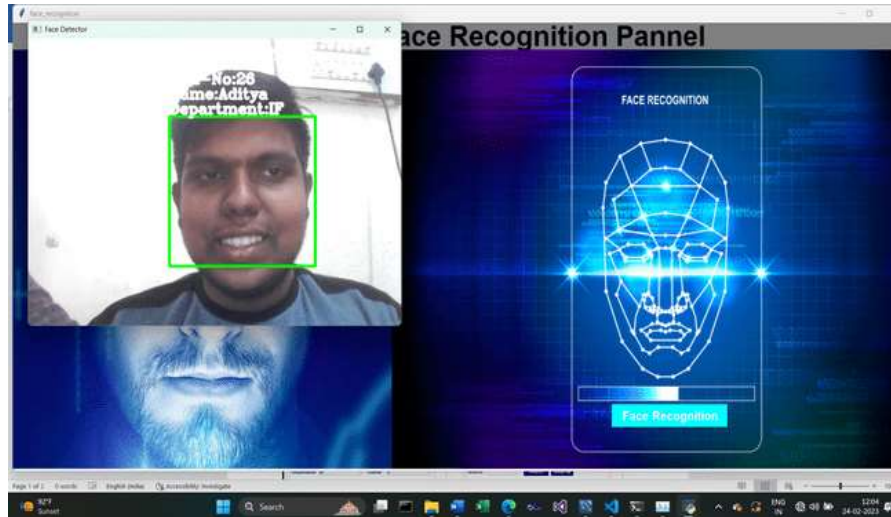
CONCLUSION

As a result, the purpose of this article is to record student video, transform it into frames, connect it to a database to verify their presence or absence, and mark attendance for a specific student in order to keep a record. In order to satisfy the demand for autonomous classroom evaluation, the Automated Classroom Attendance System aids in improving accuracy and speed, finally achieving high-precision real-time attendance.

FUTURE SCOPE

- Notification via email and sms if there is a lack of attendance.

- Creating a sheet of low attendance students

- Facility of marking manual attendance.

- Provides facility for the automated attendance of students.

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