



A NOVEL IMAGE PROCESSING BASED AUTOMATED ATTENDANCE SYSTEM USING FACE RECOGNITION

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ABSTRACT

Automated face recognition has grown significantly in popularity in recent years, mostly for two reasons: first, it is possible thanks to the availability of modern technologies, and second, it can speed up the process of taking student attendance. Due of the time it saves, its utilisation will increase significantly in the future. Manually taking attendance takes a lot of time, and some people might even fake it. To cut down on both time consumption and attendance fraud, With the use of an image or video frame, face recognition is used to identify the student in the room and record his attendance. We suggested a machine learning approach to managing attendance called the CNN algorithm. The face detection and identification technology will automatically identify the pupils in the room and record their attendance. The faculty has the ability to add student information like name, USN, contact information (phone, email, etc.). The image is then recorded using a high-definition camera during class time. The Convolutional Neural Networks (CNN) approach of machine learning is used to detect, segment, and store the faces of students during lectures for database verification.

KEYWORDS-Covolutional Neural Networks, Automated Face Recognition, Machine learning

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. Also, 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

The intended use of the proposed technology is to photograph each student's face and save it in a database for future use. This document employs the convolutional Neural Networks technique. Convolutional neural networks, often known as ConvNets, are a subset of deep neural networks that are used in deep learning to analyse visual data.

The student's face must be photographed in a method that allows for the detection of all of the student's facial characteristics, as well as the student's position and posture. The technology takes a video, which is then analysed to recognise the face and update the attendance database, eliminating the need for the teacher to physically take attendance in the classroom. The main advantage of the study is that the video data collected may be used to identify and identify students by turning the data into an image. Moreover, a recognised image of the student is included in attendance; otherwise, the database records the absence. The absent student will receive a text message at his phone number informing him of his absence.

1. Image capture: Photographs of the pupils are taken and sent for face detection.

2. Face Detection: The face recognition procedure is significantly enhanced by the use of a face detection approach.
 3. Increase the speed of the system

The system is trained on these photos as well as the image that was taken upon enrolment.

The steps for training the system are as follows:

1. Facial identification
2. Face Allignment

Facenet can be used to encode data.

One must train the SVM classifier before you can improve it.

The image that was acquired in the previous stage is the input for this stage.

Second, each image is generated with a 128-dimension unique encoding by Facenet, the system's brain. Lastly, the SVM classifier is trained using the 128 Dimension encoding.

4. Create a test picture

After being taught on the database, our system is then put into the classroom. Everything is visible thanks to the camera's setup.

5. Facial identification

IV DESIGN OF THE SYSTEM

A system's architecture, which is a conceptual design, determines the structure and behaviour of the system. An architectural description is a formal description of a system intended to aid in understanding its structural characteristics. It outlines a plan for acquiring goods and creating systems that will work together to achieve the overall system and describes the system building blocks or components. This will provide you the ability to manage your investment in a way that meets the needs of your business.

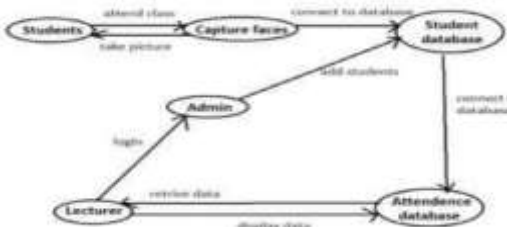


Fig.1.,System architecture

A database in the form of a csv file is given to the provided email address along with the date the attendance was taken, marking all of the students in the class as present. It has been established that the smart attendance system is a successful classroom attendance system. This tactic reduces the use of proxies and fake attendance because it is non-intrusive.

There have been several approaches to a smart attendance system, but it has been shown that a face recognition-based strategy is the best choice. It is essential to have a trustworthy system in place for recording attendance. In a classroom, we successfully used the same strategy. Our system is easy to install and operate because all that is needed for facial recognition is a basic camera module and a computer. Moreover, a Raspberry Pi with internet access can operate our system.

V.USE CASE DIAGRAM

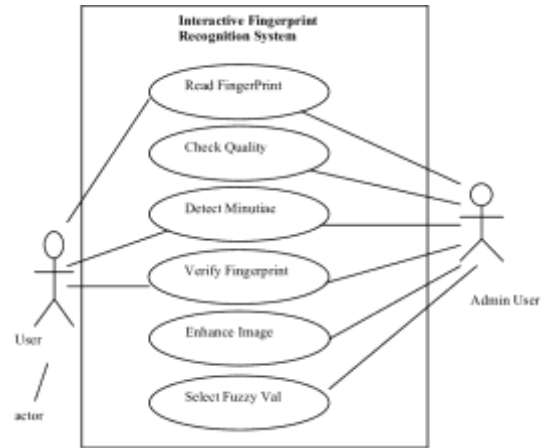


Fig.2.Use case Diagram

Use-case diagrams aid in capturing system requirements and depict a system's behaviour in UML. The scope and high-level functions of a system are described in use-case diagrams. The interactions between the system and its actors are also depicted in these diagrams.

1.Class Diagram: A class diagram in the Unified Modeling Language shows the connections and source code dependencies between classes (UML). An object, which is a particular entity in a programme or the unit of code that represents that entity in this context, or class provides the methods and variables in an object.

2.Unified Modeling Language (UML) diagrams They are used to represent the flow of messages between objects during an interaction are known as sequence diagrams. A group of objects connected by lifelines, as well as the messages they send throughout the course of an interaction, make up a sequence diagram.

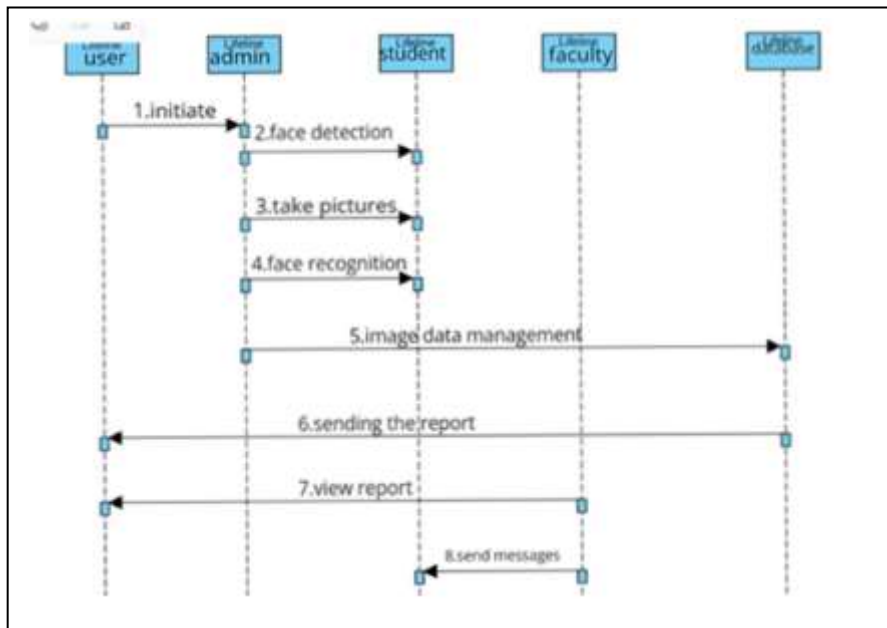


Fig.3.Sequence Diagram

VI.CONCLUSION

In this study, we develop an automatic attendance system for a classroom that uses the CNN algorithm to recognise students' faces in the classroom, section, or laboratory and automatically record their attendance. It is more efficient in terms of time and effort, particularly when there are many pupils in the class. The suggested strategy is a straightforward way to monitor a student's attendance using a camera and face recognition. The faces are entered in a database once they have been matched to confirm their presence or absence. After comparing the stored photos in the database, it automatically stamps the students' attendance in the classroom. The date can be used to track a student's attendance status and send email notifications to the teachers. Send a text message to their phone number if they aren't available. This method of automatically and covertly monitoring students during lectures and classes is a better approach to keep track of attendance.

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