IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

STUDENT ATTENDANCE USING FACE RECOGNITION

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Abstract: One of the developments in computer vision is the exploration on mortal face recognition. One of the executions of the mortal face recognition system is used as an attendance system. There are different types of attendance systems like Biometric-grounded, Radio frequency Card grounded, face recognition grounded and paper- grounded attendance system. Out of them all, a Face Recognition Based Attendance System is more secure and time- saving. We've projected our idea to apply an "Automated Attendance System Grounded on Face Recognition". The operation includes face identification, which saves time as well as being purely software grounded, it can be flagged as eco-friendly as it reduces the use of paper. Hence, this system can be enforced in a field where attendance plays an important part. The algorithm used in the system is grounded on image comparison on the base of the decoded values of the face from the image from database with the image recorded by the system in run time.

Index Terms - **Face Recognition; Face Detection; Automated Attendance system; Biometric, Radio Frequency Card.**

1. INTRODUCTION

Attendance is a crucial aspect of any educational institution. It not only helps teachers keep track of their students' progress but also ensures that students are meeting their academic requirements. However, taking attendance manually can be time-consuming and prone to errors, especially in larger classes. Fortunately, advancements in technology have made it possible to automate this process using face recognition technology. In this paper, we will discuss the use of a web-based model that utilizes a Convolutional Neural Network (CNN) algorithm for student attendance using face recognition.

1.1 Algorithm

The CNN algorithm is a type of deep learning neural network that has been successfully applied in various computer vision tasks, including image recognition, object detection, and facial recognition. CNNs are known for their ability to learn features directly from images, making them an ideal algorithm for facial recognition.

1.2 Proposed System

In the case of student attendance using face recognition, a web-based model using a CNN algorithm can automate the process of attendance taking by capturing students' images and comparing them to a created database of student images. This system is implemented using a camera and a computer or mobile device connected to the internet. Once the system captures an image, it processes the image using the CNN algorithm, which identifies the unique features of each face and compares them to the images in the database. If there is a match, the system records the attendance of the student.

1.3 Benefit

The benefits of using a web-based model for student attendance using face recognition are numerous. First and foremost, it saves time and reduces errors associated with manual attendance taking. The system can take attendance in real-time, reducing the risk of inaccurate data entry, and can also generate reports on attendance trends, making it easier for teachers to track student progress.

Additionally, a web-based model for student attendance using face recognition is cost-effective and scalable. It eliminates the need for expensive hardware or software, making it accessible to schools of all sizes. Furthermore, it can be easily integrated with other systems, such as learning management systems, to provide a comprehensive solution for managing student attendance and progress.

In conclusion, a web-based model utilizing a CNN algorithm for student attendance using face recognition is a promising solution for automating the attendance-taking process in educational institutions. With its potential to save time and reduce errors, it can enhance the learning experience for both students and teachers while providing a cost-effective and scalable solution.

2. LITERATURE SURVEY

A literature survey on student attendance using face recognition reveals that many researchers have worked on developing and testing various face recognition algorithms to improve attendance tracking systems. Studies have shown that these systems have several advantages over traditional methods of attendance tracking.

One study conducted by Chandrasekaran et al. (2021) found that a face recognition-based attendance system reduced the time spent on attendance tracking by 90% compared to traditional methods. Additionally, the system reduced the error rate and improved accuracy. [1]

Another study by Ghosh et al. (2018) found that the implementation of a face recognition-based attendance system in a college resulted in a significant improvement in attendance tracking, which led to better student performance. The system was found to be accurate, reliable, and easy to use. [2]

Automatic Control of students' attendance in Classrooms Using RFID Radio frequency identification (RFID) is one of the automatic identification technologies more in vogue nowadays. There is a wide research and development in this area trying to take maximum advantage of this technology, and in coming years many new applications and research areas will continue to appear. [3]

However, some challenges still need to be addressed in implementing face recognition-based attendance systems. One of the primary challenges is the need for a good-quality camera, which can be expensive. Another challenge is the need to ensure that the system complies with data protection regulations and safeguards the privacy of students.

In conclusion, the literature survey shows that face recognition-based attendance systems have many advantages over traditional methods of attendance tracking.

These systems have the potential to improve efficiency, accuracy, and reliability in attendance tracking in educational institutions. However, further research is needed to address the challenges and ensure that these systems comply with data protection regulations.

3. Proposed system

In this proposed system, we aim to develop an attendance tracking system that utilizes OpenCV and Face Recognition libraries for detecting faces, and a Deep Convolutional Neural Network algorithm for garbling faces to ensure accurate and reliable results.

The system will begin by capturing the images of pupils and storing them in a database for training purposes. The images will be pre-processed to ensure consistent lighting, resolution, and quality. The system will use the OpenCV library to detect faces in real-time, and the Face Recognition library to recognize faces.

Once a face is detected, the system will use the Deep Convolutional Neural Network algorithm to perform garbling. This will involve transforming the face image into a set of numerical features that can be compared to other faces in the database. The garbling process will ensure that the system is robust to changes in lighting, facial expressions, and other factors that may affect face recognition accuracy.

Once a perfect match is found, the system will induce the name, date, and time, and mark attendance as present. This information will be stored in a CSV file that can be opened with Microsoft Excel for further analysis and reporting.

To ensure the security and privacy of the data collected, the system will implement appropriate measures such as data encryption, access controls, and regular backups. The system will also comply with applicable data protection regulations and ethical guidelines.

Steps of Proposed System:

1. Image Accession

Image is acquire using a high description camera which is placed in the classroom or lab. This image is given as an input to the system.

2. Dataset Creation

Dataset of pupil is created before the recognition process. Dataset will be created only to train this system. We're going to produce a dataset of the class which will involve their name, roll number department and images of the pupil in different variations. Whenever we register pupil's data and image in our system to produce dataset, deep literacy applies to each face to cipher 128- d facial features and store in pupil face data train to recall that face in recognition process. This process will be applied to each image taken during enrollment.

3. Face Detection

Face discovery is important as the image taken through the camera is given to the system, face discovery algorithm applies to identify the mortal faces in that image, the number of image processing algorithms are introduced to descry faces in an image.

4. Face Positioning

The main function of this step is to descry milestones of faces and to place the image. A python script is used to automatically descry the face milestones and to place the face as important as possible without distorting the image.

5. Face Matching

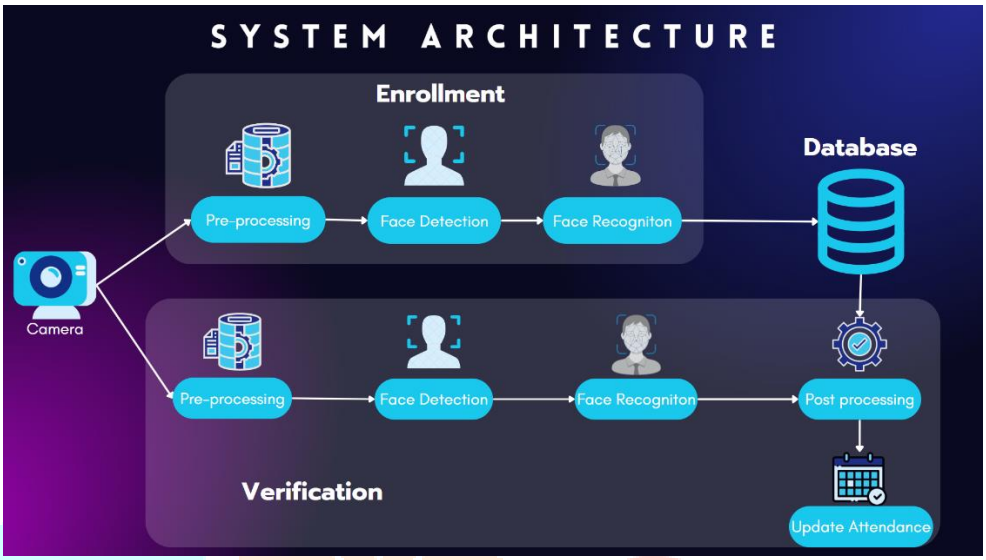
This is last step of face recognition process. We'll be using one of the stylish literacy ways that's deep metric literacy which gives largely accurate affair. The proposed system rectifies the faces, constructing the 128- d embedding foreach. However, it'll move to attendance marking If the current image is matched with the 60% threshold with the being dataset.

6. Attendance Marking

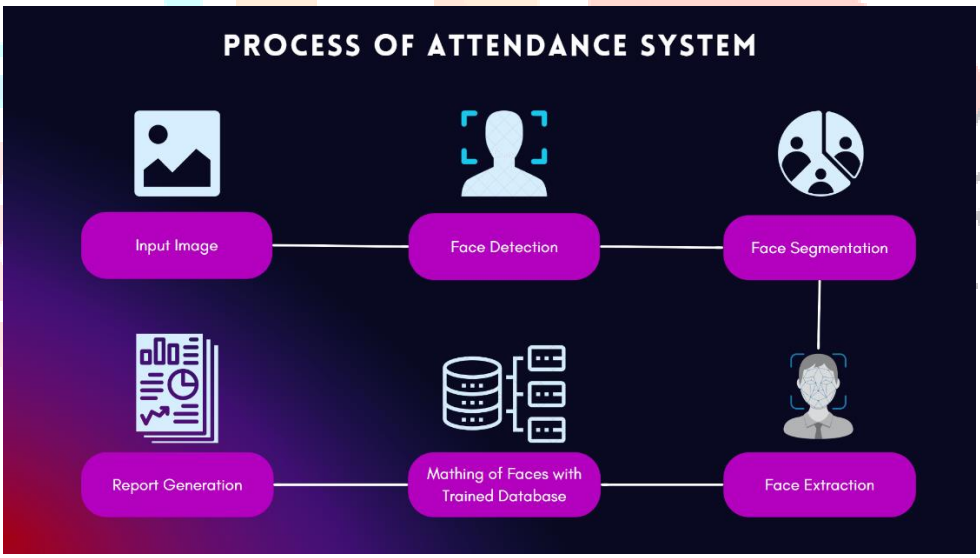
Once the face is linked with the image stored in SQL database, python generates roll figures of present scholars and return that, when data is returned, the system generates attendance table which includes the name, roll number, date, day and time with corresponding subject Id and also passes the data to python to store the table into an CSV train automatically.

4. SYSTEM DESIGNS

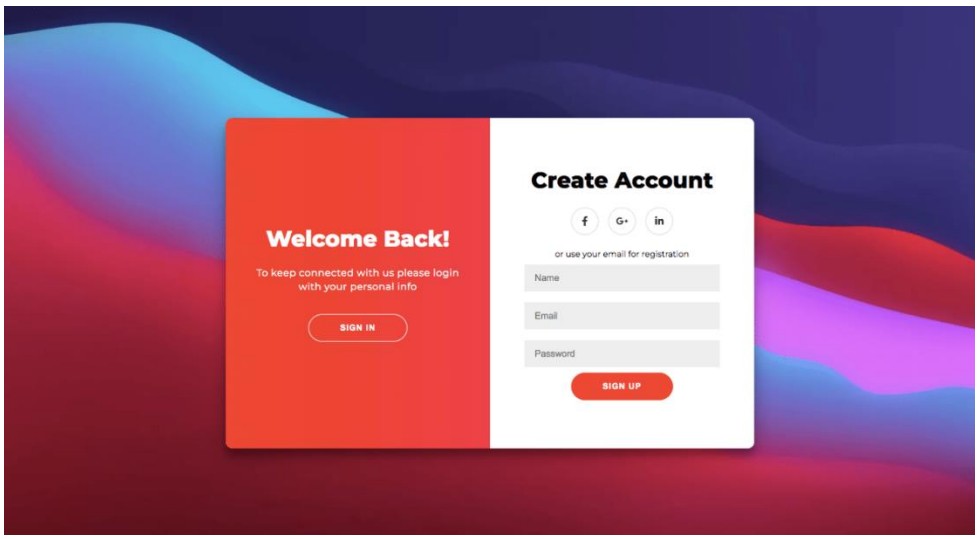
4.1 System Architecture

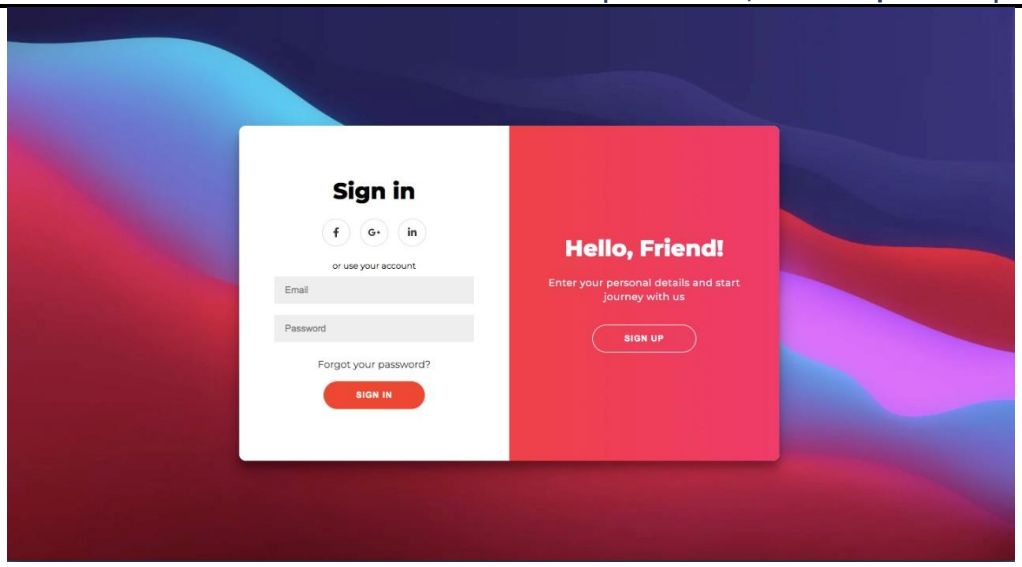


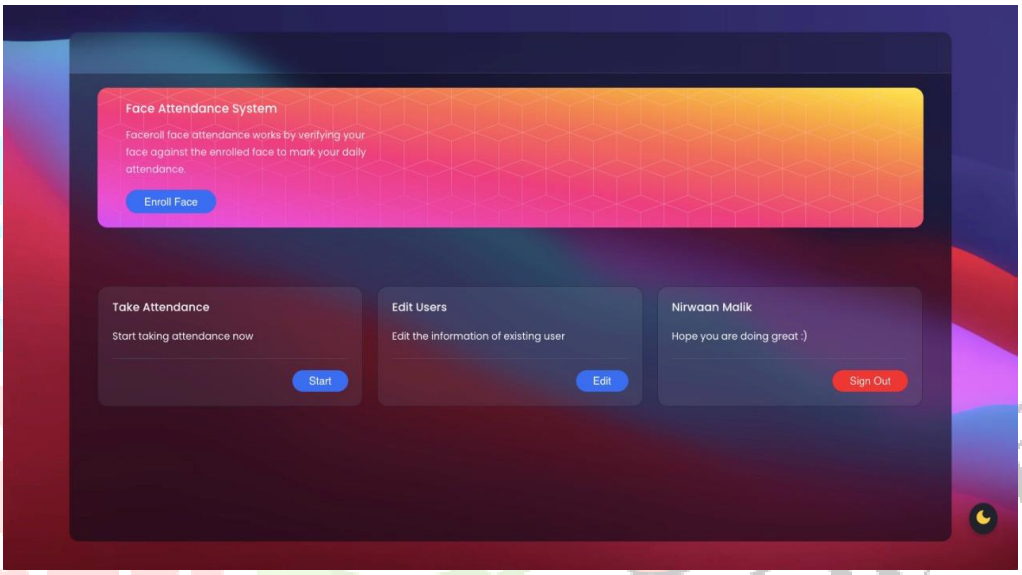
4.2 Data Flow Diagram



4.3 User Interface







5. RESULTS AND DISCUSSION

The users can interact with the system using a UI. Then user will be substantially handed with three different options similar as sign up, subscribe in and mark attendance. The students are supposed to enter all the needed details in the enrollment runners.

After clicking on register button, the web cam starts automatically and captures the faces in the frame. These images also will be pre-processed and stored in training images brochure.

We considered 2 bases as the distance of faces for recognition. The success rate of face recognition is 97%. This system recognizes students indeed when students are wearing spectacles or grown a beard.

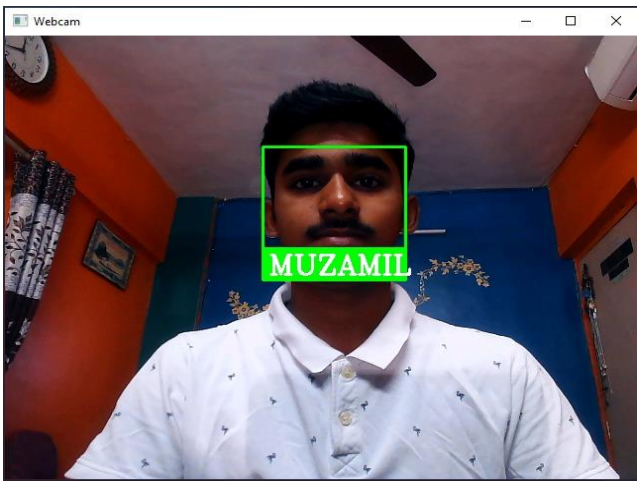


Fig.1. Face Recognition

	A	B	C
1	Name	Time	
2			
3	MUZAMIL	11:43:36	
4	ANUSHKA	11:44:07	
5	SANSKRUTI	11:18:33	
6			

Fig.2. Excel Sheet with Name and Time

6. CONCLUSION & FUTURE SCOPE

In conclusion, the proposed system involves nonstop observation of individualities at entry and exit points in order to track attendance. This can be achieved through the use of cameras or other shadowing bias that record the time and date of individualities entering and leaving a particular position.

This data can also be used to estimate attendance and to identify patterns or trends in attendance over time.

One eventuality benefit of this system is that it may be more accurate and dependable than traditional attendance marking systems, similar as paper- grounded sign- in wastes or homemade head counts.

With nonstop observation, there's lower room for error or manipulation, and it may be easier to identify cases of fraud or impersonation. also, this system could be particularly useful in settings where attendance is critical, similar as seminaries, universities, or workplaces.

By having more accurate attendance data, institutions can more track pupil or hand progress, identify areas of concern, and make further informed opinions about resource allocation or program development.

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