# Attendance Monitoring on video streaming

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**Abstract -** Image processing is a technique in which some operations are performed on an image to extract useful data from the image. The output may be an image or a characteristic of an image. Implement face recognition at runtime in a web application and run and optimize it for embedded systems. Various algorithms and methodologies are studied, along with hardware resources, and according to that, planning will be done to achieve. The goal is to compare different face recognition models based on performance and accuracy. Use neural networks to map the characteristics of a human face to a face descriptor, also sometimes referred to as face embeddings. The pixels in the image can be manipulated in any desired density and contrast. Images can be stored and retrieved easily. This work intends to use image processing for facial recognition to solve an issue of attendance management during online lectures. Teachers can't make sure that a student has logged in while attending online lectures and the true presence of the student can't be determined. The proposed solution to this issue is to use facial recognition and identification to monitor the student's presence at periodic intervals throughout the session. This solution saves teachers time and energy to manage the attendance of the whole class, helps the teacher identify the students with low attendance and increases the credibility of online education.

**Index Terms** - Facial Recognition, Attendance Management, Smart Attendance System, Image Processing, Deep Learning, FaceAPI, Face Detection.

## 1. INTRODUCTION

### 1.1 PURPOSE AND MOTIVATION:

1. To improve the effectiveness of online education in Institutions.

2. To reduce the number of proxy attendance given by students.

3. To reduce the stress of attendance management for the teacher in an online environment.

4. To present a detailed Report of a student's absenteeism in particular time frames of a session.

5. To strengthen the credibility of online examinations.

### 1.2 PROJECT OVERVIEW:

Every organization needs a robust and stable system to register the attendance of its students. and each organization has its method, some take attendance manually with a sheet of paper on which their names are written during class hours, and some have implemented biometric systems such as fingerprints, RFID card readers, and iris systems to record attendance to the mark. The traditional method of manually pronouncing student names is a very time-consuming process. With the RFID card system, each student is assigned a card with their corresponding identity, but there is a chance that the card could be misplaced, or an unauthorized person could misuse the card to falsify attendance. While other biometrics such as fingerprints, irises, or voice recognition all have their own cons and shortcomings. Using face recognition for attendance tagging is a clever form of an attendance management system. Face recognition is a more accurate and faster technique, among other techniques, and reduces the possibility of representative assistance. Face recognition offers passive identification, where a person who wants to identify themselves does not have to take any action on their identity. Identification of the recognized face images with the existing database. Various methods of face detection and recognition have been introduced. Face recognition works either in the form of an appearance that covers the features of the entire face, or a feature that covers geometric features such as the eyes, nose, eyebrows, and cheeks to recognize the face. Our system uses a face recognition approach to reduce failures of an existing system using machine learning, requires a high-quality camera to capture the students' images, and the recognition process is performed using the histogram of an oriented gradient. And recognition of achievement through deep learning. The front (client side) consists of JavaScript and the back end consists of MongoDB and NodeJS for the server.

## I. LITERATURE SURVEY

1. **Paper Name:** Open-Source Face Recognition Frameworks: A Review of the Landscape. IEEE ACCESS (2022)

   **Author:** DAVID WANYONYI AND TURGAY CELIK.

   **Abstract:** Paper reviews the landscape of open-source FR frameworks, covering components of the FR pipeline across open datasets, face detection, face alignment, face representation, identification, and verification, and deployment environments. It also discusses the current challenges and emerging directions in FR research.

   **Advantage:** With open-source frameworks with higher accuracy utilizing modern accelerated computing capabilities using     GPUs.

   **Disadvantage:** It only talks about opensource frameworks for face reorganization and not practical use.

   **Future Work:** These Open-source frameworks can be applied to solve various real-world problems.

2. **Paper Name:** Face Detection and Recognition System using Digital Image Processing. International Conference on Innovative Mechanisms (ICIMIA 2020) IEEE Xplore Part Number: CFP20K58-ART; ISBN: 978-1-7281-4167-1

   **Author:** Gurlove Singh and Amit Kumar Goel.

   **Abstract:** The area of concern of this paper is using the digital image processing to develop a face recognition system     Basically, there are two type of techniques that are currently being followed in face recognition pattern that is the    Eigen-face method and the Fisherface method.

   **Advantage:** Uses Eigenface method to make use of PCA to minimize the face dimensional space of facial features.

   **D Disadvantage:**     A relatively inefficient method of face recognition with no institutional usage.

   **Future Work:** Further work that needs to be done is in the field of fully automated frontal view FD system.

3. **Paper Name:** Face Recognition Attendance System Based on Real-Time Video Processing. Received May 18, 2020, accepted June 25, 2020, date of publication July 10, 2020, date of current version September 11, 2020. Digital Object Identifier 10.1109/ACCESS.2020.3007205

   **Author:** HAO YANG1 AND XIAOFENG HAN

   **Abstract:** This article aims to design a face recognition attendance system based on real-time video processing. This article mainly sets four directions to consider the problems: the accuracy rate of the face recognition system in the actual    check-in, the stability of the face recognition attendance system with real-time video processing, the truancy rate of   the face recognition attendance system with real time video processing

   **Advantage:** Geometric feature Method used to build an attendance monitoring system.

   **Disadvantage:** High bandwidth usage is not practical with slow mobile internet users.

   **Future Work:** - Sending notifications to students with low attendance, Notifying the mentor when a student tries to bunk.

4. **Paper Name:** Detect Faces Efficiently: A Survey and Evaluations. IEEE TRANSACTIONS ON BIOMETRICS, BEHAVIOR, AND IDENTITY SCIENCE, VOL. 4, NO. 1, JANUARY 2022

   **Author:** Yuantao Feng, Shiqi Yu, Member, IEEE, Hanyang Peng, Yan-Ran Li, and Jianguo Zhang, Senior Member, IEEE

   **Abstract:** paper introduces representative deep learning-based methods and presents a deep and thorough analysis in terms of    accuracy and efficiency. We further compare and discuss the popular and challenging datasets and their evaluation. metrics. The paper can guide to choose appropriate face detectors for different applications and to develop more efficient and accurate detectors.

   **Advantage:** -Uses various deep learning methods to implement face recognition models also talks about evaluating efficiency using FLOPs and latency.

   **Disadvantage:** Large and tough to implement. Only practical for high accuracy requiring scenarios.

   **Future Work:** - Superfast facial detection, Detecting Faces in the Long-tailed Distribution.

5.  **Paper Name:** AI-Based Techniques for Real-Time Face Recognition-based Attendance System- A comparative Study
    Fourth International Conference on Electronics, Communication and Aerospace Technology (ICECA-2020) IEEE

    Xplore PartNumber: CFP20J88-ART; ISBN: 978-1-7281-6387-1.

**Author:** Priyanka Patnaik Center of Excellence on AI, CET, India, Kalyan Kumar Mohanty Center of Excellence on Artificial Intelligence, CET, Bhubaneswar, India

**Abstract:** In this paper real-time, attendance monitoring uses a web app that can be operated remotely by using a local server and Amazon Web Service (AWS) cloud recognition Application Programming Interface (API). The first approach follows five sections face detection, preprocessing, training and face recognition and attendance will be recorded and mailed to the respective teacher. The second approach is based on AWS recognition API.

**Advantage:** Explores Real time face recognition techniques.

**Disadvantage:** This paper does not talk about how the system can be implemented with a user-friendly UI and can generate a detailed report on attendance during each timeframe.

**Future Work:** - -It can be further implemented for criminal detection so that humankind can get more help from an AI-based face recognition system.

## II. PROBLEM STATEMENT

With the onset of the pandemic era, many institutions started following remote learning mode in which instructors take classes through online meeting platforms like zoom, google meet, etc. So that students can attend lectures by staying at home, But the credibility of these classes is reduced highly compared to offline classes, Students are comfortably free to just log in and bunk the classes and it is not possible for the supervisor to keep track of every student when class size is huge, Our project aims to improve reliability on online classes by automated attendance monitoring by capturing and recognizing faces of students at random continuous intervals, making a teachers job easy and students more punctual and serious towards online education

## III. OBJECTIVE

1. To improve the effectiveness of online education in Institutions.

2. To reduce the number of proxy attendance given by students.

3. To reduce the stress of attendance management for the teacher in an online environment.

4. To present a detailed Report of a student's absenteeism in particular time frames of a session.

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## IV. PROPOSED SYTEM

Online Attendance tracking and monitoring systems are a significant task for a teacher during the online lectures so tracking multiple students at a single point of time has become a significant issue for a teacher so to solve a particular problem we have designed a web application that is used to track a student image along with the time interval and manage the attendance of students. In our web application, there was 3 sections for login the first is for the admin sign-in and the other two is for the teacher sign-in, and the students sign-in. Once the admin has enrolled their details and signup now the teacher needs to sign up with their credentials and same with the students also signup with their credentials along with their current photograph once it is done with the student side. Now whenever the faculty wants to conduct any lecture they just need to sign in with their details and click on Create a meeting option then one id will generate, and that id will be shared with the students. Now once the students sign in they just need to upload their photo and log in with the id which was given by their faculty. So in an interval of 50 min the web application which was opened into a new tab other than a meeting tab will capture a random image of 1 min in a 5 min interval so there are a total of 10 images captured by the application and marked attendance for that particular time, once the lecture will complete the faculty, will get an Excel sheet which along with the roll no the attendance will be marked for that particular student and faculty will get a complete data

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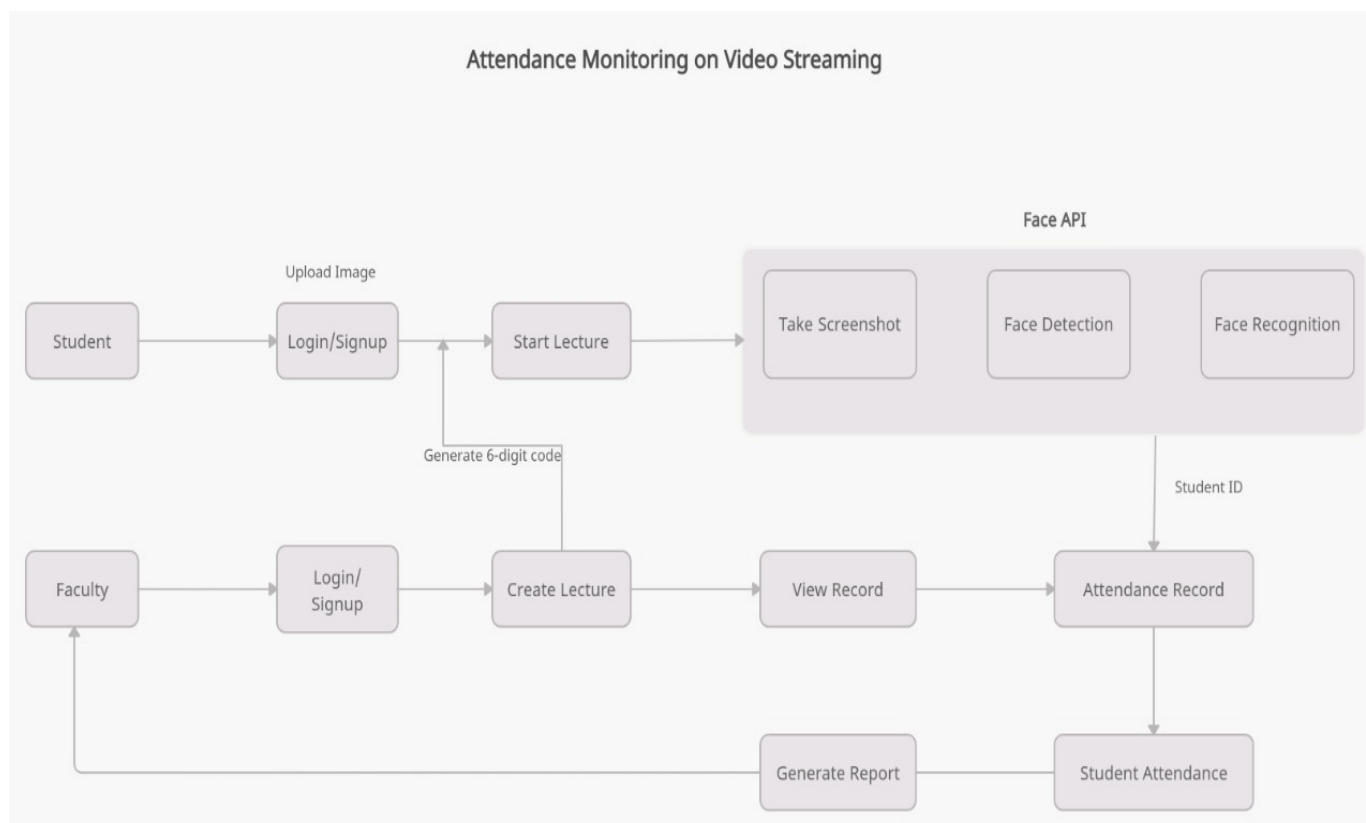
## V. SYSTEM FEATURES

**FACE DETECTION:** • DETECTING THE FACE OF THE RESPECTIVE STUDENT AFTER THEY UPLOAD A PHOTOGRAPH AND KEEP IT FOR FURTHER USE.

**CONNECTING STUDENTS AND TEACHERS:** OUR PLATFORM AIMS TO CONNECT STUDENTS AND TEACHERS IN ONE PLACE. TEACHERS CAN VIEW THE COMPLETE ATTENDANCE DETAILS OF STUDENTS. STUDENTS WILL HAVE TO BE REMAINED FOCUSED DURING LECTURES. OUR PROJECT AIMS TO CONNECT AND ENHANCE THE LEARNING EXPERIENCE.

**FACE RECOGNITION PERIODICALLY:** IT SELECTS A RANDOM MINUTE IN EVERY FIVE-MINUTE TIME INTERVAL DURING THE LECTURES AND TRIES TO CAPTURE AND RECOGNIZE THE FACE OF THE STUDENT. IT GENERATES A DETAILED REPORT HIGHLIGHTING THE PRESENCE AND ABSENCE OF STUDENTS.

**Open for improvement:** Any person with a developer's privileges can add visualizations and content to the application. This feature keeps it open for adding new algorithms and visualizations.

**Statistical reports and performance tracking:** Our Project aims to provide a statistical report of the class. Highlighting students with low and extremely low attendance.

## VI. CONCLUSION:

Online education has become an integral part of today's post-pandemic society, but problems continue to exist questioning the credibility of online education. Many students are easily able to bunk lectures after signing in and teachers cannot identify whether the student is continuously there or not. Our project aims to increase the reliability of online education by automating the attendance process and setting up face recognition technology to monitor attendance. In this Paper, we examine the use of deep neural networks in face detection and recognition. We have implemented a simple face detection and recognition system using Node.js and TensorFlow.js core API making use of existing API like the face-api.js package. This library is optimized to be used in the browser. The API allowed us to run different experiments where users can detect the emotion of a person, the gender, and the age of a person. It would be a lot tough for the students to just bunk the classes, but It would also make sure that the students remain focused on the class the whole time. It will send detailed excel sheets to the teachers including the timestamps of attendance of the whole class making online teaching efficient and more credible than before.

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