# AI-POWERED HOURLY ATTENDANCE CAPTURING SYSTEM

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**Abstract -** *Maintaining attendance is very significant in all the institutes for checking the attendance percentage of Students. Every institute has its method in this regard. Some are taking attendance manually using the old paper for every hour and later they will upload every hour data of a class to the server or file-based approach and some have adopted methods of automatic attendance using some biometric techniques. But in these methods students have to wait for a long time in making a queue for every hour. In the Process of making attendance every hour, the students may lose some portion of class every day. So this system focuses on creating an automated system using Artificial Intelligence that captures the attendance of students on an hourly basis using preinstalled cameras in the classes. We make use of AWS services to marks the attendance, store the attendance in DB.*

*Keywords: Biometric techniques, Student Attendance System, Artificial Intelligence, Face recognition, Database.*

## 1. INTRODUCTION

The face is considered a primary key to identify and talk with other people in the world. The facial features will be unique to the other industries. Humans distinguish a particular person's face based on several factors like color, nose, eyes, ears, etc.; but for computers, it's difficult to analyze the data so we may use the concept of computer vision. The intention of using computer vision technology to recognize the human features in a computer. Scientists started working on computers to recognize human faces in the mid-90 because of its enormous applications on face recognition has received continuous attention from researchers. In recent years we observed remarkable changes in face-recognition techniques because of available biometric methods, this is the most unnoticeable technique. Several algorithmic rules are implemented on face recognition and algorithms have strengths and capabilities on their own.

### 1.1 Face Recognition:

Face Recognition: Scientists started working on computers to recognize human faces in the mid-1900s because of its enormous applications on face recognition has received continuous attention from researchers. Face recognition may be outlined because of the technique of characteristic by someone based on biometrics by the approach of matching a capturing image or video with the data present in the database. The data flow process in face Recognition systems starts by having the ability to find a face and recognize frontal faces from data input devices like mobile phones, cameras, etc. [2]. Practically it has been proven that students attended classes only when there is full control on classroom and attendance monitoring.

## 2. Existing System:

The existing system is a manual entry for the students. Here the attendance will be carried out in the handwritten registers.

Disadvantages of this system are:

- It will be a tedious job to maintain the record for the user.
- The human effort is more here.
- The retrieval of the information is not as easy as the records are maintained in the handwritten registers
- This application requires correct feed on input into the respective field.
- Suppose the wrong inputs are entered, the application resists working. So the user will find it difficult

## 3. Proposed System:

To overcome the drawbacks of the existing system, the proposed system has been evolved. This project aims to reduce the paperwork and saving time to generate accurate results from the student's attendance using the latest techniques in the field of Artificial Intelligence. The system provides the best user interface and thus can be easily managed by any organization. Efficient attendance reports can be generated by using this proposed system.

The advantages of this proposed system are:

- It is trouble-free to use.

- It is a relatively fast approach to enter attendance
- Is highly reliable, approximate result from user Best user Interface Efficient reports
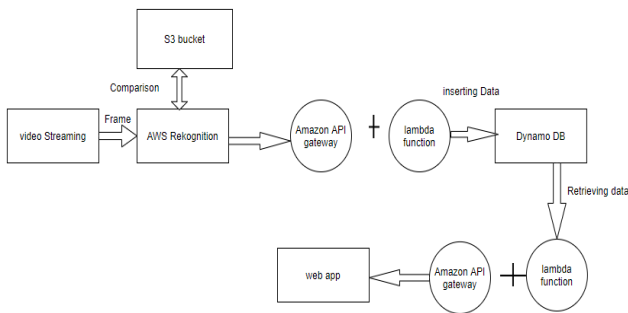- Time-saving methodology
- Human Energy conservation.

**Fig 1: Architecture of proposed system (AI-powered hourly attendance capturing system)**

- In this system, Attendance is taken hourly using preinstalled cameras. So there is no human intervention between the classes.

- The attendance taken is stored in AWS dynamo DB with the help of lambda function and API gateway which can protect our PC storage and can avoid system freeze.

- Usage of Amazon Rekognition which also provides highly accurate facial analysis, face comparison, and face search capabilities. You can detect, analyze, and compare faces for a wide variety of use cases, including user verification, cataloging, people counting, and public safety.

- Some of the literature reviews are: The student's attendance system using artificial intelligence concept mainly works using the concept of the facial recognition system. Humans distinguish a particular person's face based on several factors like color, nose, eyes, ears, etc. but for computers, it's difficult to analyze the data so we may use the concept of Computer vision. The intention of using computer vision technology to recognize the human features in a computer. In recent years we observed remarkable changes in face recognition techniques because of available biometric methods, this is the most unnoticeable technique. The installation of face recognition systems on a large scale is easy but the actual implementation of a face reorganization system is ambitious because it has to take into account for all potential cases variation caused by a modification in face expressions by light-weight, face expressions, different styles, image resolution, sensing element device, viewing distance, etc. Several algorithmic rules are implemented on face recognition and every algorithm has strengths and capabilities on its own. We tend to do face recognition nearly daily. Most of the time we glance

at the face and acknowledge by in a flash with the data present already in the database.

- For the accomplishment of the project we need components are:

  Anaconda Navigator and Packages Required: Boto-3, Opencv, Imutils, Requests, Flask

  AWS Account (Services required): Amazon S3 Bucket, Amazon recognition Service, API gateway, Lambda.

- In an anaconda navigator, we can write a Python code to create a collection to store facial information of the images in the dataset. Python code to create facial features for collection id. Python code to comparing the captured image with the stored image. Server-side scripting code to render Html template for a flask user interface to view attendance of each student.

- The AWS Account can be used to, Store the Images of Students in the S3 Bucket. Create collection ID names for student's faces. Create individual collection IDs.Load the captured images to the Face comparison algorithm (compares the faces in the s3 bucket). Mark the attendance for compared faces and store in Dynamo DB. Create a rest API using API gateway and lambda function to connect to dynamo DB for inserting and retrieving student attendance.

## 4. Implementation

#### A. Data Collection

As it is a face recognition-based system, there is a need to acquire the images of students to train the machine. So a collection of images of all the students - one image for a student is sufficient.

#### B. Configure Aws Account

To complete this project first of all configuration of Aws Account by creating an IAM user is a major step.

#### C. Store Images in S3 Bucket

In this activity, upload all the images collected to the S3 bucket. These uploaded images will be used to compare the faces from the target image (image capture on an hourly basis from the classroom)

#### D. Searching Faces in a Collection

Amazon Recognition can store information about detected faces in server-side containers known as collections. You can use the facial information that's stored in a collection to search for known faces in images, stored videos, and streaming videos. Amazon Recognition supports the

IndexFaces operation. You can use this operation to detect faces in an image and persist information about facial features that are detected into a collection. This activity is an example of a storage-based API operation because the service persists information on the server.

To store facial information, you must first create (CreateCollection) a face collection in one of the AWS Regions in your account. You specify this face collection when you call the IndexFaces operation. After you create a face collection and store facial feature information for all faces, you can search the collection for face matches. To search for faces in an image, call SearchFacesByImage. To search for faces in a stored video, call StartFaceSearch. To search for faces in a streaming video, call CreateStreamProcessor.

E.   Insert Attendance into DynamoDB through API

Gateway

To develop a script for an hourly attendance marking system. This includes the following procedure
1. Capture the image on an hourly basis.
2. Upload the capture face image to s3.
4. Compare the captured faces with s3 and fetch the matched details.
5. Check the time.
6. And store the attendance of each person in Dynamo DB.

To store attendance. First, create a Dynamo table that contains the class period and the name of the student who is present. Then upload data to Cloud and we should create an API gateway HTTP URL which we will be using in our python script
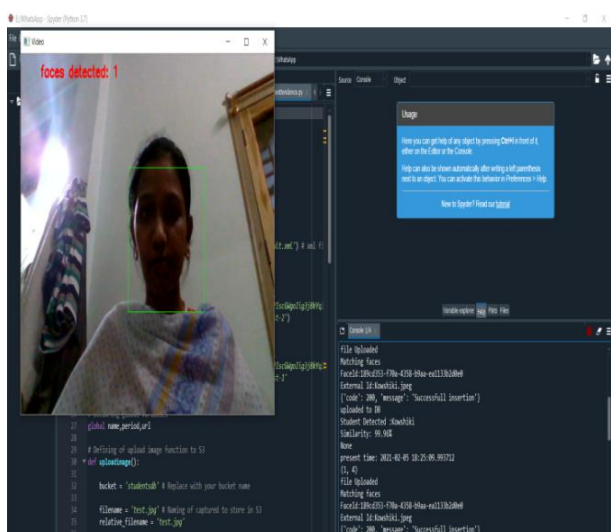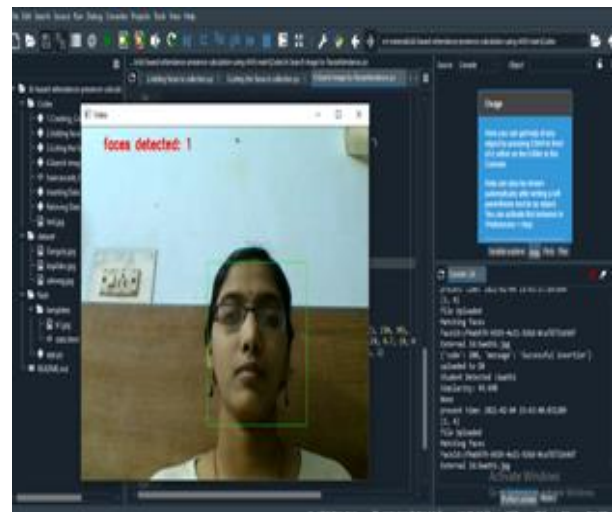

**Fig 2: Face Detection**


**Fig 3: Face Detection**

F.   Building an Application (Flask)

In this milestone, start building a web application for the user interface to check the attendance of each student, the total number of detections.
Follow & complete the below activities, to accomplish this milestone.
Create a Lambda Function to retrieve data
Create API using API gateway
Showcase Attendance on Flask User Interface


**Fig 4:Total Detections**


**Fig 5: Hourly students Presence calculation**

## 5. CONCLUSION AND FUTURE SCOPE

This system is secure and convenient for the user according to storage and all other performance measures. It also ensures an easier way to give attendance for each student as it captures the image of the person along with data and time. This system can also be implemented in industries, schools, and offices for accurate attendance marking Future Enhancement of the system is live classes taken by the professor can be recorded and sent automatically to the absentees of the particular day.

## References

[1]   Morgan, Kamalahasan & Hemasundari, H & Apoorva, K & Akthar, J. (2020). 'AI Powered Face Recognition based Attendance Marking System' 2020.

[2]   K P, Naveen Reddy & Alekhya, T & Manjula T, Sushma & Krishnappa, Rashmi. (2020). AI-Based Attendance Monitoring System. 'International Journal of Innovative Technology and Exploring Engineering'. 9. 10.35940/ijitee.B1057.1292S19.

[3]   P.C., .Senthil. (2020). 'Face Recognition Based Automated Student AttendanceSystem using Deep Learning.' International Journal of Advanced Trends in Computer Science and Engineering. 9.3887-3891.10.30534/ijatcse/2020/208932020.

[4]   Chintalapati, Shireesha & Raghunadh, M.. (2013). 'Automated attendance management system based on face recognition algorithms'. 1-5. 10.1109/ICCIC.2013.6724266.

[5]   [5] Smitha , Pavithra S Hegde , Afshin, 2020, ace Recognition based Attendance Management System', INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT) Volume 09, Issue 05 (May 2020),

[6]   Nithya. C, Ramya Bharathi. M, Santhini. M, Sowmya. R, 2020, 'Face Recognition based-Automatic Attendance Management System', INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT) NCICCT – 2020 (Volume 8 – Issue 08),