A Project/Dissertation Review-1 Report

on

ATTENDANCE USING FACE RECOGINITION

Submitted in partial fulfillment of the

requirement for the award of the degree

of

Bachelor of Technology in Computer Science and Engineering

(Established under Galgotias University Uttar Pradesh Act No. 14 of 2011)

Under The
Supervision of
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SCHOOL OF COMPUTING SCIENCE AND ENGINEERING DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING GALGOTIAS UNIVERSITY, GREATER NOIDA INDIA OCTOBER 2021

SCHOOL OF COMPUTING SCIENCE AND ENGINEERING
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CANDIDATE'S DECLARATION

I/We hereby certify that the work which is being presented in the thesis/project/dissertation, entitled **"ATTENDANCE USING FACE RECOGINITION"** in partial fulfillment of the requirements for the award of the Btech.CSE submitted in the School of Computing Science and Engineering of Galgotias University, Greater Noida, is an original work carried out during the period of month, Year to Month and Year, under the supervision of Mr.S.P.Ramesh Assistant Professor, Department of Computer Science and Engineering/Computer Application and Information and Science, of School of Computing Science and Engineering , Galgotias University, Greater Noida

The matter presented in the thesis/project/dissertation has not been submitted by me/us for the award of any other degree of this or any other places.

Ansh Saxena(19SCSE1010502)

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This is to certify that the above statement made by the candidates is correct to the best of my knowledge.

MR.S.P. Ramesh

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CERTIFICATE

The Final Thesis/Project/ Dissertation Viva-Voce examination of Ansh Saxena 19SCSE1010502, Mohammad Azaan 19SCSE1010446 has been held on _____ and his/her work is recommended for the award of Bachelor of Technology in Computer Science and Engineering

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Signature of Examiner(s)   **Signature of Supervisor(s)**

Signature of Project Coordinator   **Signature of Dean**

Date: November, 2013

Place: Greater Noida

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ABSTRACT

Face recognition software is used to match computer images to human faces. Face recognition is one of the most useful image processing applications, and it is crucial in the technological world. For verification purposes, the recognition of a human face is a hot topic, notably in the context of school attendance. Face biostatistics based on high-definition monitoring and other computer technologies are used to identify children in a face recognition-based attendance system. In this project, we will learn how to perform high-accuracy facial recognition. We'll start by reviewing the theory and learning how to apply it. Then we'll develop an Attendance project that uses a webcam to recognise faces and record attendance in an excel sheet automatically. The proposed concept intends to automate attendance in a variety of businesses. Face recognition attendance system is a method of identifying pupils using face biostatistics based on high-definition monitoring and other computer technologies. Face recognition can be accomplished using a variety of methods. KNN, CNN, and SVM are examples of machine learning techniques. The Attendance Management System is easy to use and effective. The method works well in a variety of stances and variations. This system will need to be enhanced in the future because it sometimes fails to recognise pupils from a distance. We also have some processing limitations, so working with a high-processing system could result in even better results.

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CHAPTER 1

INTRODUCTION

The necessity to preserve the security of information or physical property in today's networked environment is becoming both increasingly crucial and increasingly challenging. We hear about credit card fraud, computer break-ins by hackers, and security breaches in companies and government buildings from time to time.

Students must be engaged and attend classes on a regular basis for an educational institute to succeed. A higher attendance score translates to better grades, retention rates, and an overall better educational experience. If pupils are regularly missing, it is difficult for teachers and students to form a strong bond. This makes it difficult for teachers and students to improve their skills and grow. The average daily attendance of the school is used to determine the school budget in many cases. School budgets suffer when attendance rates are low. As a result, schools have less money to purchase vital classroom supplies for kids, resulting in lower-quality education. As a result, the educational institution requires accurate attendance records. These data are critical for the institute to develop policies, programmers, and practices that will increase attendance rates.

Despite the fact that preserving attendance data is an important aspect of educational institutions, the attendance system has not progressed much. Despite this, many institutes still employ handwritten attendance or a computerized spreadsheet. This makes it difficult for teachers to keep track of pupils' attendance and development. The chances of attendance fraud are higher in this approach than in an automated attendance system. Schools cannot develop effective policies and strategies to improve education quality unless attendance data is accurate.

Biometric access control refers to automated techniques of validating or detecting a living person's identity based on physiological traits like fingerprints or facial features, or behavioral characteristics like handwriting style or keyboard patterns. Biometric systems are difficult to counterfeit since they identify a person based on biological traits. Face recognition is one of the rare biometric techniques that combines high accuracy with little intrusiveness. It's as accurate as a physiological method without being as obtrusive. As a result, face recognition has piqued the

interest of academics in domains ranging from security, psychology, and image processing to computer vision.

Face recognition is essential in everyday life in order to recognize family, friends, or someone we know. We may not realize that multiple steps have been taken in order to recognize human faces We can receive information thanks to our intelligence.

In the recognition process, you must analyse and evaluate the data.

This project will aid in the elimination of the traditional attendance method, the reduction of manipulation during attendance, and the recording of the students' arrival time. It's also simple to use and maintain. There are certain drawbacks to this programme, as with any other. The application isn't completely correct. Different issues, such as image quality and a shortage of data sets, can reduce the application's efficiency.

Administrators must manually enter user information, and data sets kept are at risk of being lost or stolen.

The human face is a one-of-a-kind expression of personal identity. Thus, face recognition is described as a biometric approach for identifying an individual by comparing a real-time capture image with photographs recorded in that person's database. Face recognition systems have been popular in recent years due to their ease of use and excellent performance. Face recognition is used in criminal investigations by airport security systems and the FBI to track criminals, missing children, and drug trafficking. In addition, Facebook, a major social networking website, uses face recognition to allow users to tag their friends in photos for entertainment purposes. Furthermore, the Intel Corporation allows customers to log into their online accounts using face recognition. Face recognition is a feature that Apple allows consumers to utilise to unlock their iPhone X.

The physical shape and qualities of a person's face are used to identify or verify that person. This biometrics of the face is recorded using facial recognition. The biometric of the face is measured using several face recognition technologies. In recent years, facial recognition has become a hot topic. Security systems, authentication, admission control, surveillance systems, unlocking cellphones, and

social networking platforms, among other applications, use facial recognition efficiently. The majority of practices do not employ facial recognition as the primary method of admittance. However, as technology and algorithms progress, facial recognition systems may be able to replace traditional passwords and fingerprint scanners.

Face recognition research began in 1960. Woody Bledsoe, Helen Chan Wolf, and Charles Bisson devised a system that required the administrator to identify eyes, ears, nose, and mouth from photographs. After that, the distance and ratios between the found features and the common reference points are calculated and compared.

Goldstein, Harmon, and Lesk (1970) improved the findings by utilising other variables such as hair colour and lip thickness to automate the recognition. Kirby and Sirovich proposed principle component analysis (PCA) to tackle the face recognition problem for the first time in 1988. Many facial recognition research have been undertaken since then, and they are still ongoing today. Face recognition became a viable biometric for business after Sirovich and Kirby applied linear algebra to it. They devised the "Eigenface" system, which required fewer than one hundred values to accurately code the facial image. Turk and Pentland's discovery of face detection within an image in 1991 paved the way for automated facial recognition. This paved the path for facial recognition technology to expand and flourish.

Face detection refers to the ability to recognise people's faces in digital photographs. This method recognises the human face in a photograph or video. To assess whether a photograph or video has a face, we must first define the general structure of a face. Eyes, nose, forehead, mouth, and chin are all common features on human faces. As a result, the goal of face detection is to determine the location and size of a face in a photograph. The facial recognition system then uses the found face. Face detection is the process of determining the position of a person's face. In other words, it is the process of finding the face region in a photograph. After detecting a human's face, its facial features are retrieved, which can be used for a variety of purposes such as facial expression recognition, face recognition, surveillance systems, and human-computer interfaces. Attendance is critical for both teachers and students in a learning environment. As a result, keeping track of

attendance is critical. When we consider the usual method of taking attendance in the classroom, we encounter a difficulty. Calling name or roll number of the student for attendance is not only a problem of time consumption but also it needs energy. As a result, an automatic attendance system can address all of the issues mentioned above. Many institutions currently use automated attendance systems. Biometrics is an example of such a system. Despite being automatic and one step ahead of the traditional way, it falls short of the deadline. The student must wait in line to give his or her attendance, which takes time. This project proposes an involuntary attendance marking system that does not interfere with conventional teaching procedures in any way. The technique can also be used during exam sessions or other classroom activities where punctuality is critical. This system replaces traditional student identification methods such as calling the student's name or checking the student's identification cards, which can not only disrupt the teaching process but also be stressful for students during examination sessions. The use of facial recognition for attendance marking in an attendance management system is a sensible solution. Face recognition is more accurate and faster than other systems, and it decreases the risk of proxies being present.

Face recognition allows for passive identification, which means that the individual being recognised does not have to do anything. Facial recognition systems have a wide range of applications. They're used in security, authentication, verification, and surveillance systems, among other things. Without without realising it, we are communicating with facial recognition technologies. Face recognition systems are used by many businesses for identity, verification, and security. This system can be used in a variety of ways. Face recognition technology is now being installed in public venues such as airports, cafes, shopping areas, factory areas, and government buildings in countries such as the United States, the United Kingdom, and Australia. Alibaba, a huge retail corporation, is focusing on developing pay-by-face technology. Employees' clock in and out times are recorded using this technology in work environments. To identify offenders and seek for missing people, law enforcement agencies are deploying cameras with facial recognition technologies. We will see more and more facial recognition technology and algorithms deployed in our culture as facial recognition technology and algorithms progress.

A facial recognition technology has the potential to transform the way businesses and governments engage with their citizens. However, there are possible problems with this technology if it is not used appropriately. The risk of personal and sensitive data being misused is quite high. Before deploying this technology, businesses and organisations must ensure that suitable checks and balances are in place, as well as adequate security. When this technology scans someone's face, the person's unique biometrics are saved in a database. Information can be leaked, stolen, or misused without the agreement of the person, depending on who owns the database and the security measures in place to safeguard it. Facial recognition software is not without flaws. The algorithms are trained using data acquired by people.A facial recognition system is an excellent solution to these issues. Students' faces will be captured in Realtime as they are learning in class using face detection, and the learning process will be smooth. Students can also be attentive without being interrupted to sign for their attendance and miss out on some of the lecturer's information. For the lecturer, there is no need to keep track of all of the students' attendance registrations for future reports because the attendance is created automatically by the system. Because the odds of students falsifying documents have been reduced, the data generated for the report will be accurate, and there will be no more misleading data. With the development of new technology, a new sort of crime has emerged. By hacking the database, criminals might gain access to the facial recognition data and follow people's movements, locations, and information without their consent. With the help of a facial recognition technology, criminals can wreak significant damage. To perpetrate a crime, they can take critical personal information or a person's identity. The use of facial recognition technology has a lot of potential. It must, however, be handled with caution. Businesses who want to use this technology must set up the right framework and take seven steps to protect their customers' facial data. They can reap the benefits of this technology if they are successful in using it.In less than a second, the face recognition software recognises a person's face and enters their attendance in the system. There is no physical contact. Organizations can use a face recognition attendance system as a preventative step to stop the corona virus from spreading. While assuring time and attendance management efficiency and accuracy. If your company has been utilising a fingerprint biometrics attendance system, it's time to upgrade to a touchless facial recognition biometric system. If not, you should definitely think about digitising your daily office processes.

A facial recognition attendance system employs facial recognition technology to automatically identify and verify a person based on their facial features. The software can be utilized by a variety of persons, including employees, students, and others. The data is recorded and stored in real time by the system. The entire atmosphere is automated with a facial recognition attendance system. You'll be able to take attendance and you'll also be able to automatically record the employees' entry and exit times. It also improves workplace security because the system can correctly identify who left the designated area and when.

CHAPTER 2

LITERATURE SURVEY

In recent years, one of the most effective comprehensive applications of image analysis and facial recognition has gained a lot of attention. Furthermore, researchers in the fields of image processing, pattern recognition, neural networks, computer vision, computer graphics, and psychology are all interested in machine recognition of human faces. It is clear that user-friendly methods are required to secure our assets and protect our privacy without losing our identity in a sea of numbers. People utilise their faces to distinguish and recognise acquaintances and family members. Computers can currently recognise people based on recorded information such as their figure, iris, or face. Several face recognition methods were previously used to create a fully automated face identification process. The first facial recognition technology was created in the 1960s. It wasn't completely automated; it needed annual inputs of where the eyes, ears, nose, and mouth were on the images, after which it calculated a distance to a common point and compared it to the stored data. They still have an image problem, which has both advantages and disadvantages.

Due to the regulated structure of the imager acquisition process, the segmentation difficulty is very simple for applications such as driver's licence. If only a static image of an airport scene is available, automatic face location and segmentation could be a huge challenge for any segmentation system.

However, if a video sequence is available, motion as a signal can be used to more easily partition a moving figure. Face recognition may be more difficult due to the small size and low image quality of faces seen on video. The technique of assigning a label to recognised faces, also known as face identifying, is known as face recognition. As previously stated, we may memorise the faces of our family members and celebrities simply by looking at them. Since the 1970s, many methodologies and algorithms for teaching a machine to recognise familiar faces have been developed. The bulk of modern approaches include at least three phases:

- Face detection:
- Face preprocessing:
- Face recognition:

Face Detection: it is a computer technique that uses artificial intelligence (AI) to discover and identify human faces in digital photographs. Face identification has developed from simple computer vision techniques to breakthroughs in machine learning (ML) and associated technologies.

Face recognition can be thought of as a subset of object-class detection. The goal of object-class detection is to locate and size all items in an image that belong to a specific class. Upper torsos, people, and automobiles are all examples. The detection of frontal human faces is the focus of face-detection algorithms. It's similar to image detection, where a person's image is matched bit by bit. The image is identical to the image stored in the database. Any modifications to the database's face features will render the matching procedure useless.

Face Preprocessing: The goal of applying preprocessing steps in a face identification system is to reduce false positives and speed up the detection process. An adequate number of non-face windows should be rejected by a preprocessing stage.

Face Recognition: it is a means of recognising or validating an individual's identification by looking at their face. Face recognition software can identify persons in photographs, videos, or in real time. During police stops, officers may use use mobile devices to identify persons.

Biometric security includes facial recognition. Voice recognition, fingerprint recognition, and ocular retina or iris recognition are all examples of biometric software. Although the technology is mostly utilized for security and law enforcement, there is growing interest in other applications.
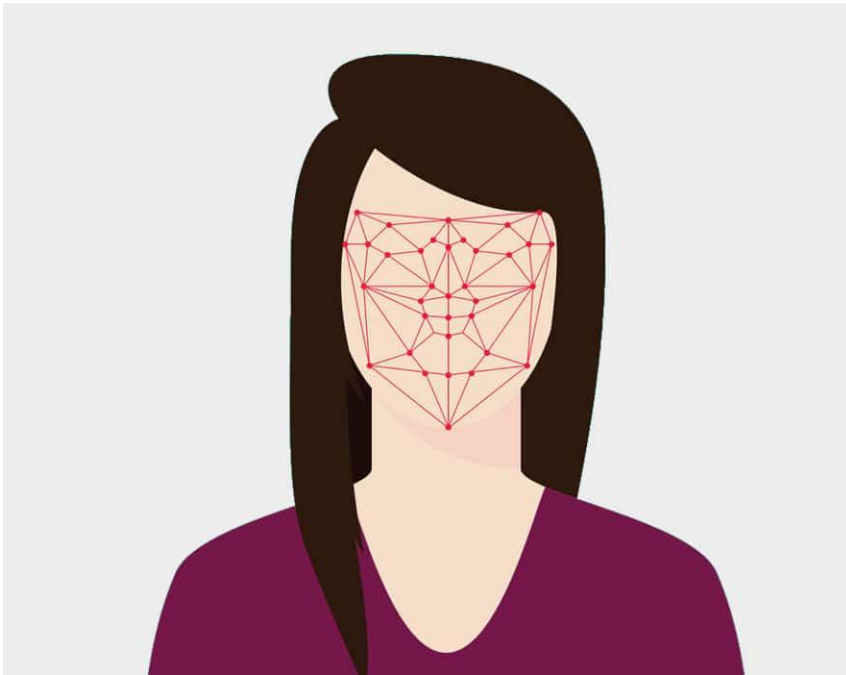
Feasibility Analysis:

A feasibility study assesses a project's chances of success; as a result, perceived objectivity is a key aspect in the research's credibility with possible investors and lenders. As a result, it must be conducted objectively and unbiasedly in order to produce information on which judgments can be made. We'll go over three important feasibility studies that are required for our project.

Operational Feasibility:

The operational feasibility of a proposed system is a measure of how well it handles the users' concerns. Operational feasibility is determined by the project's human resources and entails predicting whether the system will be used after it is built and installed. Because practically all teachers and staff are conversant with digital technology nowadays, the project is operationally possible for the users.

Economic Feasibility:

The term "economic feasibility" refers to whether the anticipated benefit is equal to or greater than the anticipated expenditures. It's also known as a cost-benefit analysis. The technique entails calculating the system's predicted advantages and savings and comparing them to the costs. The benefits of the proposed approach are expected to outweigh the expenses.

This is a low-budget project with no development costs. The system is simple to comprehend and use. As a result, there is no need to invest in training in order to use the system. This system has the ability to expand by adding features for both students and teachers. This is a possibility. As a result, the project may reap financial rewards in the future.

Technical Feasibility:

The purpose of technical feasibility is to establish whether the project is possible in terms of software, hardware, manpower, and knowledge to complete. It explores how the planned system's resources would be determined.

The system is platform agnostic because it is written in Python.

As a result, users of the system can run on any platform and have average processing capabilities. Because the technology is cutting-edge, the system is also technically feasible.

CHAPTER 3
SYSTEM ANALYSIS
HARDWARE REQUIREMENTS

- 4 GB RAM (Minimum)
- 80 GB HDD.
- Dual Core processor.
- CDROM (installation only). VGA resolution monitor.
- Microsoft Windows 98/2000/NT with service pack 6 / XP with service pack 2/ Windows 7 with service pack 2.
- SQL Server 2008 R2.

SOFTWARE REQUIREMENTS

- Jupyter Software
- Data Set
- Python
- Machine learning and NPL

EXISTING SYSTEM

- Attendance is critical for both teachers and students in a learning environment. As a result, keeping track of attendance is critical. There are a variety of attendance management systems available, each with its own level of complexity and practicality. We've categorised them into three levels: basic, moderate, and advanced.
- The Manual Attendance System involves the process of the faculty calling out the roll calls. If the student is present in the class, the student physically acknowledges the roll call and says that he/she is present. In all other cases, the faculty marks the student absent
- The Paper Based Attendance System is a part of the manual attendance system or could be used for any other attendance system as well. Attendance

is taken in any form and it's recorded on a paper by writing either the absentees, or the presentees only. Usually, faculties write the roll numbers of the students that are absent or present as per convenience.

- Token-based attendance entails displaying a security token when required to confirm attendance. A security token is a small piece of hardware that the owner carries about to approve access to a network service. The gadget could take the shape of a smart card or be integrated in a common object like a key fob. The token in the case of students is usually their identification card.

- There are numerous articles in the literature that are linked to RFID-based Attendance Systems. Students use an RFID tag type ID card that they must place on the card reader to record their attendance in an RFID-based system.

- A portable fingerprint device can be circulated among students, allowing them to place their finger on the sensor during lecture time without the need for the instructor's intervention. This technology ensures that attendance is recorded in an error-free manner.

PROBLEM DEFINITION

- Attendance is a crucial element of the daily evaluation in the classroom.
- The traditional method of recording student attendance is frequently fraught with problems
- During lecture sessions, an attendance list is distributed around the classroom in addition to calling names. In a lecture class, especially one with a high number of students, passing the attendance sheet around the class may be challenging.
- As a result, a face recognition student attendance system is proposed to replace the manual signing of students' presence, which is inconvenient and causes pupils to become distracted when signing for their attendance.
- A face recognition-based attendance system solves the problem of recognising faces
- for the purpose of collecting attendance by utilising face recognition technology based
- on high-definition monitor video and other data technology.

- The goal of face recognition is to enable a computer system to quickly and accurately locate and recognise human faces.
- Several algorithms and strategies have been developed to improve facial recognition performance.

PROPOSED SYSTEM

- The proposed concept intends to automate attendance in a variety of companies.
- Facial features of the student are registered into the database. Students are recognized based on these stored facial features, and if a match is found, the student is marked present and the same is updated into the database.
- The system has been completely automated. The algorithm runs for a few minutes at the start of each hour, capturing the attendance of pupils in class, and then resumes at the start of the next hour until the conclusion of the day.
- Once the algorithm successfully recognizes the student, the attendance for the corresponding student is updates into the database automatically, without any human intervention.
- The entire system is effectively broken down into three parts. First, the model is trained and the facial features are saved. Second, the student is identified using the facial recognition system. Third, the database is automatically updated with the attendance information.
- Another benefit of this approach is that students do not have to line up in front of the camera to be acknowledged and have their attendance updated. Because the technology is capable of detecting numerous faces at once, it saves time.
- A face recognition attendance system is a method of identifying pupils using face biostatistics based on high-definition monitoring and other computer technologies.
- Face recognition can be accomplished using a variety of methods.
- Machine learning techniques including KNN, CNN, and SVM
- The proposed method proved to be a reliable and efficient instrument for taking attendance in a classroom with minimal time and effort.

ARCHITECTURE DAIGRAM

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                    │ system data base    │
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                    │ Recognition process │
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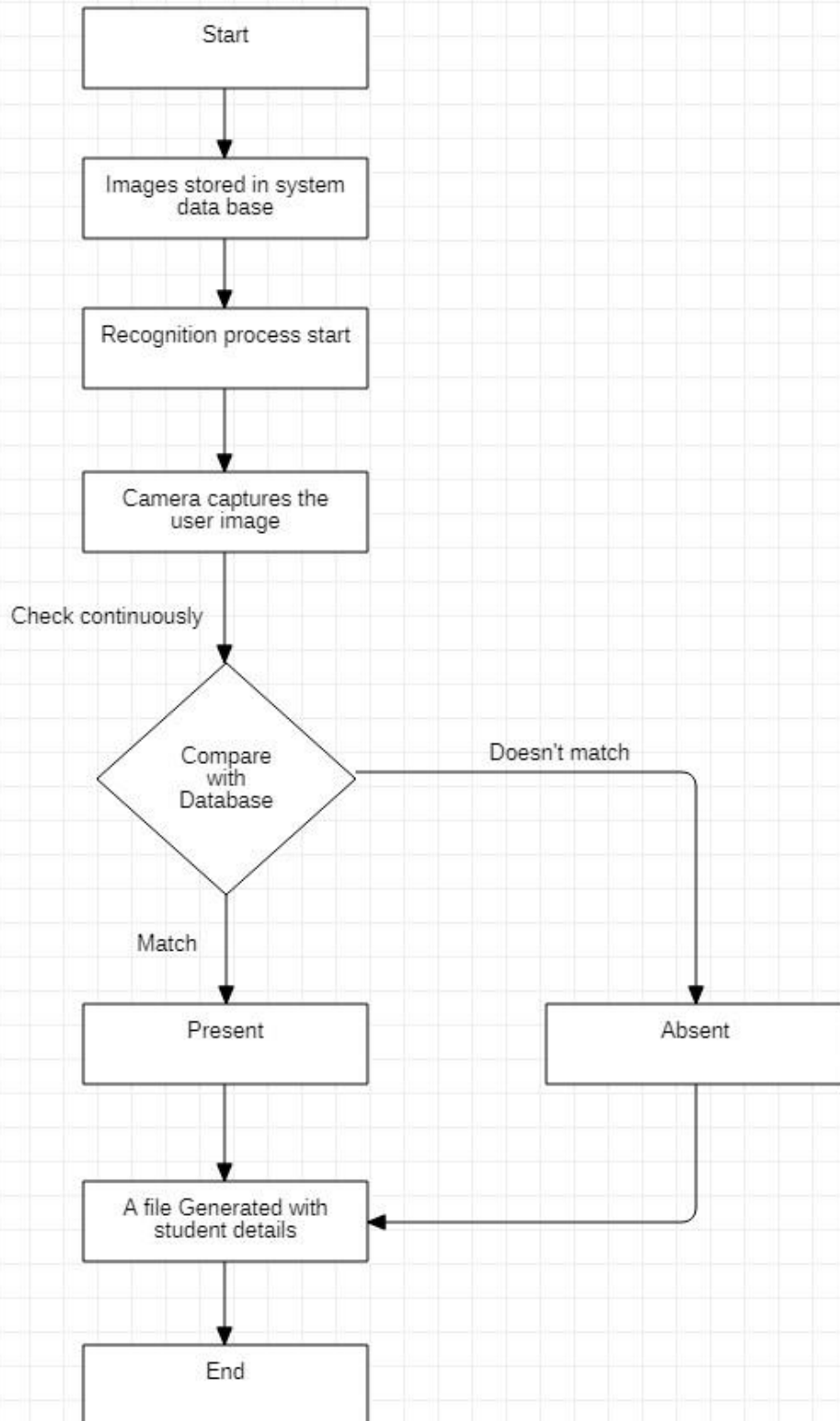
Architecture Diagram: -

As shown in Figure, the proposed framework consists of three major steps: Data capturing, Data processing and updating. The architecture diagram includes the following step:

- In the first step of defined proposal the images are stored into the database to provide the data set to compare the students face during live time to capture the attendance.
- From the stored images the features extraction will take place which will also get stored in the system.
- In the next step recognition process starts where when a user operates the system camera starts and the user's image is then compared with the given database.
- If the user's image already exists in the system, then the system identifies you and give you the name and with the same name and time and date user's attendance get captured in the excel sheet.
- If it matches with the following database the user is marked as present.
- In the last step the file is generated with the student details for the given class or process.

MODULE DESCRIPTION:

Image Acquisition: Image acquisition is the operation of acquiring an image from a source, usually hardware systems such as cameras, sensors, and so on, in image processing and machine vision. It is the first and most crucial stage in the workflow sequence because the system cannot perform any processing without an image.

Image Preprocessing: Image processing is a technique for converting an image to digital form and then performing operations on it to create a better image or extract important information. It's a signal distribution method in which the input is an image, such as a video frame or a photograph, and the output is an image or image-related features. Typically, an image processing system treats images as two-dimensional signals that are subjected to pre-determined signal processing procedures.

Feature Extraction:- This module is in charge of creating a feature vector that accurately represents the facial image. Its purpose is to extract relevant data from the sample that has been taken. The holistic feature category and the local feature category are the two types of feature extraction. Based on established distances between face features such as the eyes, nose, and mouth, local feature-based techniques attempt to automatically find them. The holistic feature category is concerned with the entire input facial image.

Face Recognition: Facial recognition is a technology-based method of recognising a person's face. Biometrics are used by a face recognition system to map a person's face from a photograph or video. To find a match, it compares the knowledge to a database of known faces. Facial recognition can aid in the verification of identity, but it also raises concerns about privacy.

Face Detection: Face detection is a technique that recognises human faces in digital photos and is used in a variety of applications. The psychological process by which humans locate and attend to faces during a visual scene is known as face detection.

Find Match in database: Our database contains student templates or graphics that we use to identify and track attendance. Depending on the situation, this database can be modified or added to. This database is compared to an image's extracted feature to certify a successful hit.

Update Attendance Sheet.xlsx: If a match is identified, our algorithm updates the attendance of the user with the same name and along with time and date in an excel file.

MERITS OF PROPOSED SYSTEM

- Isn't it true that everyone enjoys saving money? Faculty can use facial recognition software to track their student's attendance while avoiding human mistake.

- Facial recognition attendance systems can completely automate entry and exit time tracking that was previously done manually or with other biometric systems. The system's powerful algorithms can locate and recognise faces without the requirement for human participation or physical validation. With facial recognition, keeping track of time for employees is a breeze.

- By automating employee time monitoring, a facial recognition attendance system can help businesses save money. Truein, for example, can be utilised on mobile devices, making it more accessible to small and medium-sized organisations.

- Pandemics like as Covid 19 can be better managed by limiting physical contact in public spaces and at work. There has been a substantial surge in demand and implementation of contactless technology since the pandemic. The benefits of facial recognition and the deployment of attendance systems have been acknowledged by the industry. Workplaces and multi-tenant workplaces can significantly minimize the frequency of individual contact, lowering the danger of virus transmission.

- Face recognition attendance systems are not reliant on a few facial traits, but rather on a number of data points to identify a face. As a result, these systems can detect face masks and identify people without removing the mask or changing facial characteristics such as beards or specs. Employees do not have to remove their masks, which is a significant benefit over any other biometric method. Modern attendance systems include highly precise face recognition algorithms that can track changes in facial characteristics such as spectacles, beards, and hats, among other things.

- Industrial floor time fraud is a regular occurrence all around the world, and it is one of the most common workplace ethical breaches. While the vast majority of employees are trustworthy, buddy punching cannot be ruled out. Some people skip work and yet get paid by collaborating with coworkers or

security officers. Such time fraud is not only harmful to businesses, but it is also unjust to hardworking employees.
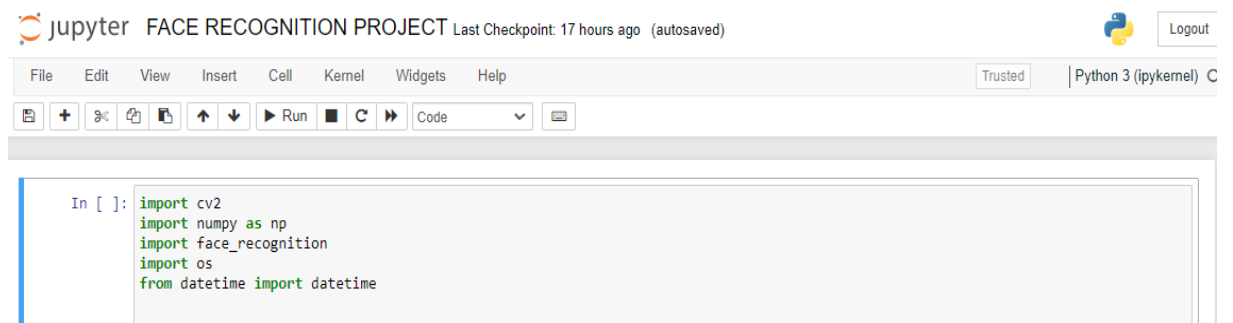
- The entire atmosphere is automated with a facial recognition attendance system. You'll not only be able to take attendance, but you'll also be able to automatically record the employees' entry and exit times. It also improves workplace security because the system can correctly identify who left the designated area and when.

- Front-facing cameras are embedded into nearly all smartphones, tablets, and computers. This means that no additional hardware is required to build a facial recognition attendance system. When compared to other biometric systems such as fingerprint scanners, this is more cost-effective and convenient. Work-from-home employees do not require any training or orientation because they are already accustomed to using the front-facing camera on their mobile device. These systems offer simple user interfaces that anyone can use.

- AI-based attendance systems are highly automated as compared to manual attendance methods. Day-to-day records are stored and updated in real time by these systems. Facial recognition attendance systems are configured to handle everything from daily attendance to creating very accurate timesheets for individual employees on a huge scale. Imagine being able to handle a large crowd of 10,000 people with ease while also keeping track of attendance in a systematic manner. The effectiveness of AI facial recognition algorithms is astounding.

- It's simple to integrate a face recognition attendance system with any other HRMS or payroll system. The time-in, time-out, and date formats can be adjusted to be compatible with other systems in an organisation because these systems are modular and extremely flexible. It makes data organisation a lot easier. Additionally, the time zone settings may be readily altered based on geo-location, allowing the software to be used globally without any additional requirements. A corporation with geographically dispersed offices can use a GPS-based attendance system to track attendance in all of its locations.

IMPLEMENTATION

There are several steps to implement this model: -

- Download the software (JUPYTER)
- Download the python library
- Prepare database and start working

Downloading Libraries: -

Data Base:-

Code:-

```python
import cv2
import numpy as np
import face_recognition
import os
from datetime import datetime


path = 'IMAGES'
images = []
personNames = []
myList = os.listdir(path)
print(myList)
for cu_img in myList:
    current_Img = cv2.imread(f'{path}/{cu_img}')
    images.append(current_Img)
    personNames.append(os.path.splitext(cu_img)[0])
print(personNames)


def faceEncodings(images):
    encodeList = []
    for img in images:
        img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
        encode = face_recognition.face_encodings(img)[0]
        encodeList.append(encode)
    return encodeList


def attendance(name):
    with open('Attendance.csv', 'r+') as f:
        myDataList = f.readlines()
        nameList = []
        for line in myDataList:
            entry = line.split(',')
            nameList.append(entry[0])
        if name not in nameList:
            time_now = datetime.now()
            tStr = time_now.strftime('%H:%M:%S')
            dStr = time_now.strftime('%d/%m/%Y')
            f.writelines(f'\n{name},{tStr},{dStr},{"Present"}')
```

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Trusted | Python 3 (ipykernel) O

```python
encodeListKnown = faceEncodings(images)
print('All Encodings Complete!!!')

cap = cv2.VideoCapture(0)

while True:
    ret, frame = cap.read()
    faces = cv2.resize(frame, (0, 0), None, 0.25, 0.25)
    faces = cv2.cvtColor(faces, cv2.COLOR_BGR2RGB)

    facesCurrentFrame = face_recognition.face_locations(faces)
    encodesCurrentFrame = face_recognition.face_encodings(faces, facesCurrentFrame)

    for encodeFace, faceLoc in zip(encodesCurrentFrame, facesCurrentFrame):
        matches = face_recognition.compare_faces(encodeListKnown, encodeFace)
        faceDis = face_recognition.face_distance(encodeListKnown, encodeFace)
        # print(faceDis)
        matchIndex = np.argmin(faceDis)

        if matches[matchIndex]:
            name = personNames[matchIndex].upper()
            # print(name)
            y1, x2, y2, x1 = faceLoc
            y1, x2, y2, x1 = y1 * 4, x2 * 4, y2 * 4, x1 * 4
            cv2.rectangle(frame, (x1, y1), (x2, y2), (0, 255, 0), 2)
            cv2.rectangle(frame, (x1, y2 - 35), (x2, y2), (0, 255, 0), cv2.FILLED)
            cv2.putText(frame, name, (x1 + 6, y2 - 6), cv2.FONT_HERSHEY_COMPLEX, 1, (255, 255, 255), 2)
            attendance(name)

    cv2.imshow('Webcam', frame)
    if cv2.waitKey(1) == 13:
        break

cap.release()
cv2.destroyAllWindows()
```
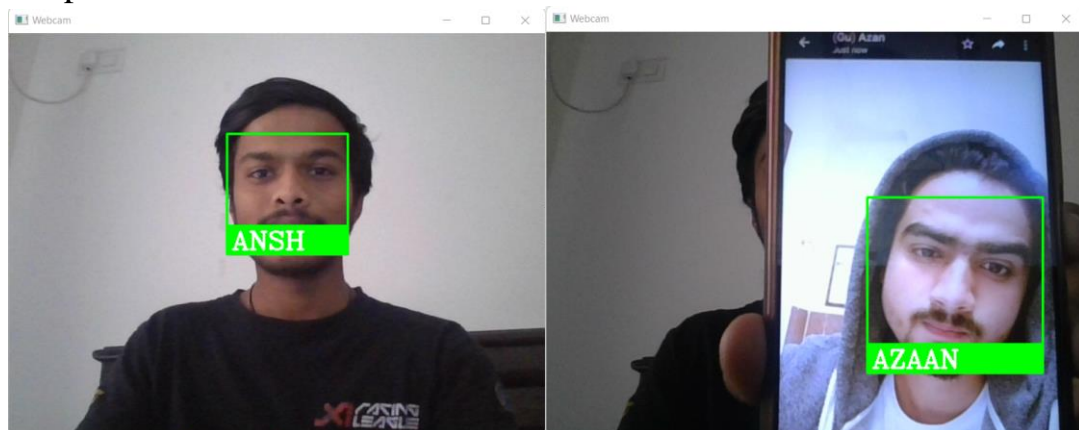
OutPut:-

```
['Ansh.jpeg', 'azaan.jpeg']
['Ansh', 'azaan']
All Encodings Complete!!!
```

Output:-

Output(Attendance): -

CONCLUSION AND FUTURE SCOPE

The Automated Attendance System is created with the goal of lowering the number of errors that occur in traditional (manual) attendance systems. The goal is to automate and create a system that will benefit an organization like an institute, in the office, the most efficient and precise technique of attendance that can replace the old manual methods. This method is secure, dependable, and readily available. At order to implement the system in the office, no specialist hardware is required. It can be made with a camera and a computer.

Almost all academic institutions need students to keep track of their attendance, and keeping track of attendance manually can be a time-consuming and stressful endeavor. As a result, keeping attendance automatically with the use of face recognition will be extremely beneficial and error-free as compared to a manual procedure. This will also decrease student manipulation of attendance records while also saving time. The suggested work's future scope could include collecting many detailed photographs of the kids and storing these images utilizing any cloud technology. To identify fraud, the technology can be designed and deployed in ATM machines. Additionally, the technique can be utilized during elections to identify voters by identifying their faces.

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