

SECURE AND EFFICIENT FACIAL IDENTIFICATION BASED ATTENDANCE SYSTEM FOR INSTITUTION

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Engineering degree in Computer Science and Engineering

by

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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SCHOOL OF COMPUTING**

SATHYABAMA

**INSTITUTE OF SCIENCE AND
TECHNOLOGY (DEEMED TO BE
UNIVERSITY)**

**Accredited with Grade "A" by NAAC | 12B Status by UGC | Approved by
AICTE**

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119

MARCH - 2022



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING **BONAFIDE CERTIFICATE**

This is to certify that this Project Report is the bonafide work of **Mohit Kumar Patnaik (38110324)** and **Suyash Verma (38110583)** who carried out the project entitled **"SECURE AND EFFICIENT FACIAL IDENTIFICATION BASED ATTENDANCE SYSTEM FOR INSTITUTION"** under my supervision from November 2021 to March 2022.

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DECLARATION

I **Mohit Kumar Patnaik (38110324)** and **Suyash Verma(38110583)** hereby

Declare that the Project Report entitled " **SECURE AND EFFICIENT FACIAL IDENTIFICATION BASED ATTENDENCE SYSTEM FOR INSTITUTION**" done by me under the guidance of **Dr. A. PRAVIN M.E., Ph.D.** Is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Computer Science and Engineering.

DATE:

PLACE:

SIGNATURE OF THE CANDIDATE

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ABSTRACT

Attendance is a major part of any institution in the whole world. Since older times, Attendance are taken with the help of roll call manually and marked in the register and vice versa. It is a tedious task to do given the modern age we are in right now. Since, every task is automated so why not taking attendance!. Moreover, manual task involves human error which is unavoidable. In a mission to automate and modernize the attendance marking system, We created a digital attendance which marks present or absent with the help of Scanning in camera and maintaining a database in backend. This system recognize face with the help of LBPH algorithm and Haar cascading algorithms which in turn generates a facial map. The algorithm used above gives better results compared all other similar algorithms available Defining whole requirement and management is defined as a necessary step in the developing the successful software projects and systems

TABLE OF CONTENTS

	ABSTRACT	v
	LIST OF FIGURES	viii
	LIST OF ABBREVIATIONS	ix
CHAPTER NO.	TITLE	PAGE NO.
1.	INTRODUCTION	1
	1.1 INTRODUCTION	1
	1.2 TECHNOLOGIES USED	3
	1.3 ALGORITHM USED	9
2.	LITERATURE SURVEY	16
	2.1 LITERATURE REVIEW	16
3.	AIM AND SCOPE OF THE PRESENT INVESTIGATION	22
	3.1 PROBLEM STATEMENT	22
	3.2 AIM OF THE PROJECT	22
	3.3 OBJECTIVES	23
	3.4 EXISTING SYSTEM	24
	3.5 PROPOSED SYSTEM	24
4.	EXPERIMENTAL OR MATERIALS AND METHODS	26
	4.1 ARCHITECTURAL DIAGRAM	26
	4.2 MODULE DESCRIPTION	28
5.	RESULTS AND DISCUSSION, PERFORMANCE ANALYSIS	35
6	SUMMARY AND CONCLUSIONS	40

REFERENCES	41
APPENDIX	
A. SOURCE CODE	43
B. PLAGIARISM REPORT	47

LIST OF FIGURES

FIGURE NO.	NAME OF THE FIGURE	PAGE NO.
1.1	Deep Learning Layers	3
1.2	Deep Learning Process	4
1.3	Example of LBPH	10
1.4	Circular LBH	12
1.5	Integral Image	1 4
1.6	Integral Image is used here to calculate the Haar value	1 5
1.7	Exceptional case while calculating haar value	1 5
4.1	Face detection Architecture	2 6
4.2	Calculation in LBPH Algorithm	2 7
4.3	Add Record	2 9
4.4	Delete record	2 9
4.5	Train The data	3 0
4.6	Photo Sample	3 1
4.7	Face Recognizer	3 2
4.8	Attendance Report	3 3
4.9	Admin report	3 3

LIST OF ABBREVIATIONS

CNN	Convolutional Neural Network
ILSVRC	ImageNet Large Scale Visual Recognition Challenge
RNN	Recurrent Neural Networks
HTS	Hand tracking and segmentation

CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION

The human face plays an important role in our social interaction, conveying people's identity. Using the human face as a key to security, biometric face recognition technology has received significant attention in the past several years due to its potential for a wide variety of applications in both law enforcement and non-law enforcement.

As compared with other biometrics systems using fingerprint/palmprint and iris, face recognition has distinct advantages because of its non-contact process.

Face images can be captured from a distance without touching the person being identified, and the identification does not require interacting with the person.

In addition, face recognition serves the crime deterrent purpose because face images that have been recorded and archived can later help identify a person.

After quitting it, attendance of person will be stored in report table in the databases with name, id, date and time and status.

This attendance system can be readily used by non-programming personal avoiding human handled chance of error. In this project apart from marking attendance by face recognition, one can register new user, update details of user and delete details. Train dataset, extract embedding's, change password, and view the attendance report.

In this project, to recognize their face and marking their attendance, the individual had to register their details in employee management system. Then extract embedding for every new individual and then train the machine according to the sample photos taken. After that the individual is free to mark their attendance. The person can also check their attendance status, update details, delete details, check sample photos and also change the password credentials. The database is updated automatically, no need to update manually.

Pros

1. Automated Time Tracking System

Entry and exit time monitoring done manually or with other biometric systems can be

fully automated with facial recognition attendance systems. There is no need for human intervention or physical validation as the system's advanced algorithms can locate and identify faces autonomously. It is effortless to track time for employees with facial recognition

2. Cost Effective

A facial recognition attendance system can save business resources by automatic employee time tracking.. Irrespective of the business size, such an attendance system can:

- Increase employee productivity by 10%
- Cut administrative costs by 5-10%
- Save 15% supervision time, helping supervisors with attendance control

The cost savings are even higher as data received from the face recognition-based employee attendance system is in real-time and valid.

3. Touchless Sign In System: A Post Pandemic Requirement

Pandemic like Covid 19 can be better managed by minimizing physical contact in public places and work environments. Post pandemic there has been a significant increase in demand and adoption of contactless technologies. The industry has recognized the benefits of facial recognition and the adoption of attendance systems like Truein. Workplaces and multi-tenant environments can greatly reduce the frequency of contact between individuals, thus minimizing the risk of virus transmission.

Cons

1. Threatens individual and societal privacy

The threat to individual privacy is a significant downside of facial recognition technology. People don't like having their faces recorded and stored in a database for unknown future use.

Privacy is such a big issue that some cities, including San Francisco, California and Cambridge,

2. Imposes on Personal Freedom

Being recorded and scanned by facial recognition technology can make people feel like they're always being watched and judged for their behavior. Plus, police can use facial recognition to run everyone in their database through a virtual criminal lineup, which is like treating you as a criminal suspect without probable cause.

1.2 TECHNOLOGIES USED

Deep learning is a computer software that mimics the network of neurons in a brain. It is a subset of machine learning and is called deep learning because it makes use of deep neural networks. Deep learning algorithms are constructed with connected layers.

- The first layer is called the Input Layer
- The last layer is called the Output Layer

- All layers in between are called Hidden Layers. The word deep means the network join neurons in more than two layers.

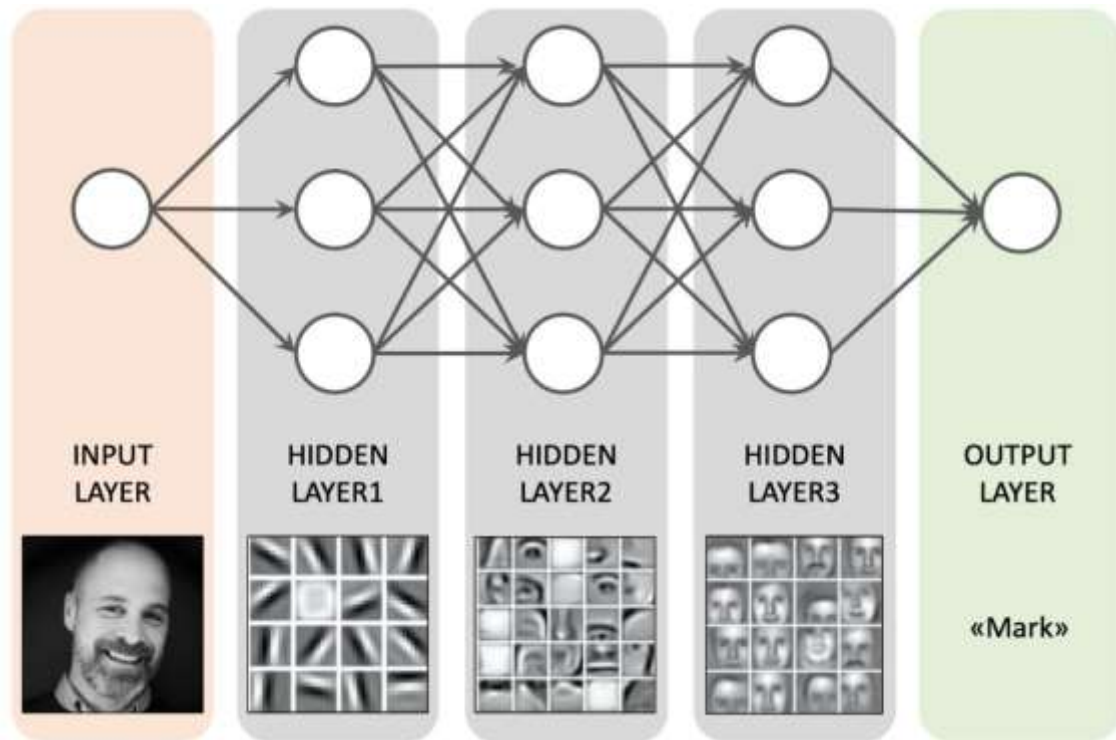


Figure 1.1 Deep Learning Layers

Each Hidden layer is composed of neurons. The neurons are connected to each other. The neuron will process and then propagate the input signal it receives the layer above it. The strength of the signal given the neuron in the next layer depends on the weight, bias and activation function.

The network consumes large amounts of input data and operates them through multiple layers; the network can learn increasingly complex features of the data at each layer.

1.2.1 Importance of Deep Learning:

Deep learning is a powerful tool to make prediction an actionable result. Deep learning excels in pattern discovery (unsupervised learning) and knowledge-based prediction. Big data is the fuel for deep learning. When both are combined, an organization can reap unprecedented results in term of productivity, sales, management, and innovation.

Deep learning can outperform traditional method. For instance, deep learning algorithms are 41% more accurate than machine learning algorithm in image classification, 27 % more accurate in facial recognition and 25% in voice recognition.

1.2.2 Deep Learning Process:

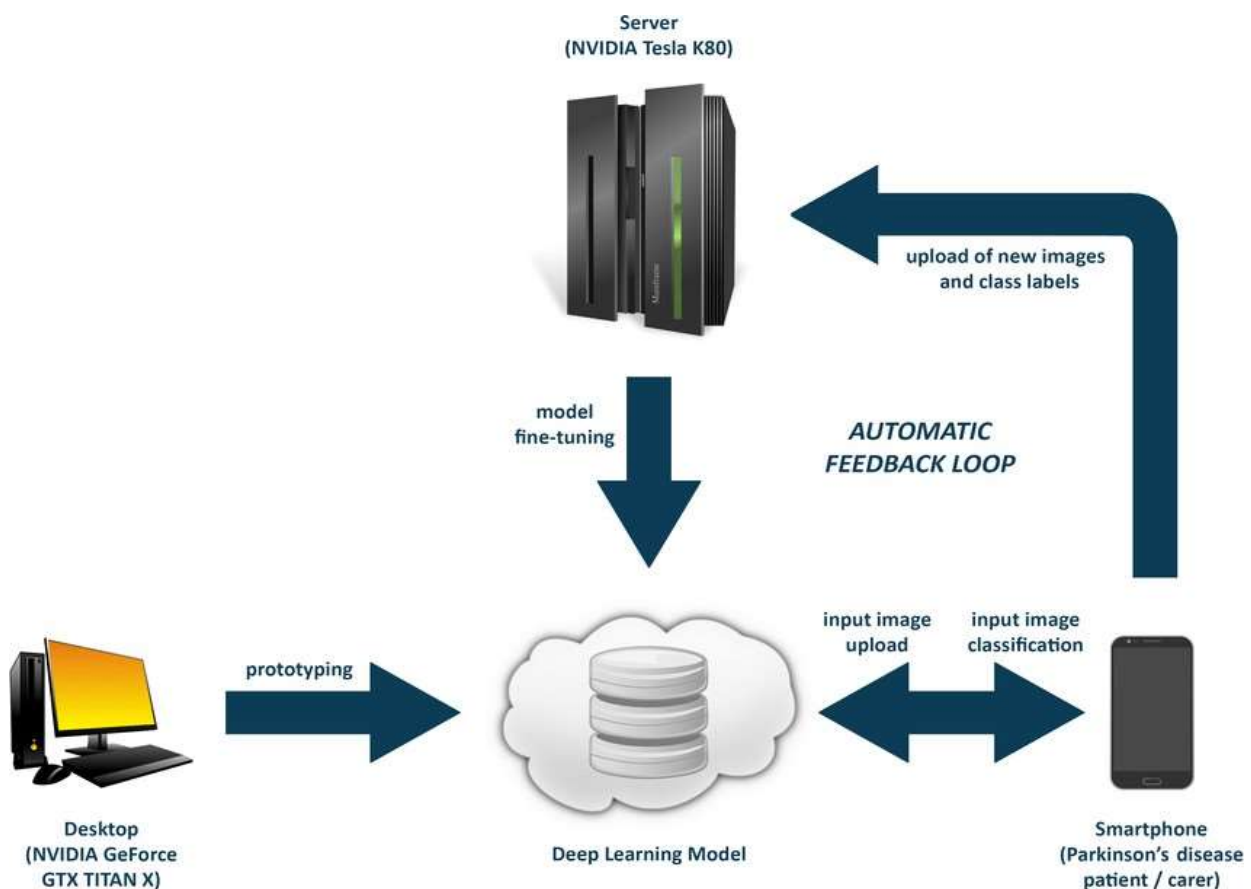


Figure 1.2 Deep Learning Process

A deep neural network provides state-of-the-art accuracy in many tasks, from object detection to speech recognition. They can learn automatically, without predefined knowledge explicitly coded by the programmers.

To grasp the idea of deep learning, imagine a family, with an infant and parents. The toddler points objects with his little finger and always says the word 'cat.' As its parents are concerned about his education, they keep telling him 'Yes, that is a cat' or 'No, that is not a cat.' The infant persists in pointing objects but becomes more accurate with 'cats.' The little kid, deep down, does not know why he can say it is a cat or not. He has just learned how to hierarchies complex features coming up with a cat by looking at the pet overall and continue to focus on details such as the tails or the nose before to make up his mind.

A neural network works quite the same. Each layer represents a deeper level of knowledge, i.e., the hierarchy of knowledge. A neural network with four layers will learn more complex feature than with that with two layers.

The learning occurs in two phases.

- The first phase consists of applying a nonlinear transformation of the input and create a statistical model as output.
- The second phase aims at improving the model with a mathematical method known as derivative.

The neural network repeats these two phases, hundreds to thousands of time until it has reached a tolerable level of accuracy. The repeat of this two-phase is called an iteration.

1.3 Algorithm Used:

For determination of disease and for prediction purposes, there are five important type of algorithms are used. These algorithms have all the type of prediction accuracy and have all the precision control. These are:-:

- Local Binary Pattern Histogram (LBPH)
- Viola-Jones Face Detection Technique(Haar Cascades)

1.3.1 Local Binary Pattern Histogram(LBPH)

Local Binary Pattern (LBP) is a simple yet very efficient texture operator which labels the pixels of an image by thresholding the neighborhood of each pixel and considers the result as a binary number.

It was first described in 1994 (LBP) and has since been found to be a powerful feature for texture classification. It has further been determined that when LBP is combined with histograms of oriented gradients (HOG) descriptor, it improves the detection performance considerably on some datasets.

Using the LBP combined with histograms we can represent the face images with a simple data vector.

As LBP is a visual descriptor it can also be used for face recognition tasks, as can be seen in the following step-by-step explanation.

The steps of the algorithm:

1. **Parameters:** the LBPH uses 4 parameters:

- **Radius:** the radius is used to build the circular local binary pattern and represents the radius around the central pixel. It is usually set to 1.
- **Neighbors:** the number of sample points to build the circular local binary pattern. Keep in mind: the more sample points you include, the higher the computational cost. It is usually set to 8.

- **Grid X:** the number of cells in the horizontal direction. The more cells, the finer the grid, the higher the dimensionality of the resulting feature vector. It is usually set to 8.
- **Grid Y:** the number of cells in the vertical direction. The more cells, the finer the grid, the higher the dimensionality of the resulting feature vector. It is usually set to 8.

2. Training the Algorithm: First, we need to train the algorithm. To do so, we need to use a dataset with the facial images of the people we want to recognize. We need to also set an ID (it may be a number or the name of the person) for each image, so the algorithm will use this information to recognize an input image and give you an output. Images of the same person must have the same ID. With the training set already constructed, let's see the LBPH computational steps.

3. Applying the LBP operation: The first computational step of the LBPH is to create an intermediate image that describes the original image in a better way, by highlighting the facial characteristics. To do so, the algorithm uses a concept of a sliding window, based on the parameters **radius** and **neighbors**.

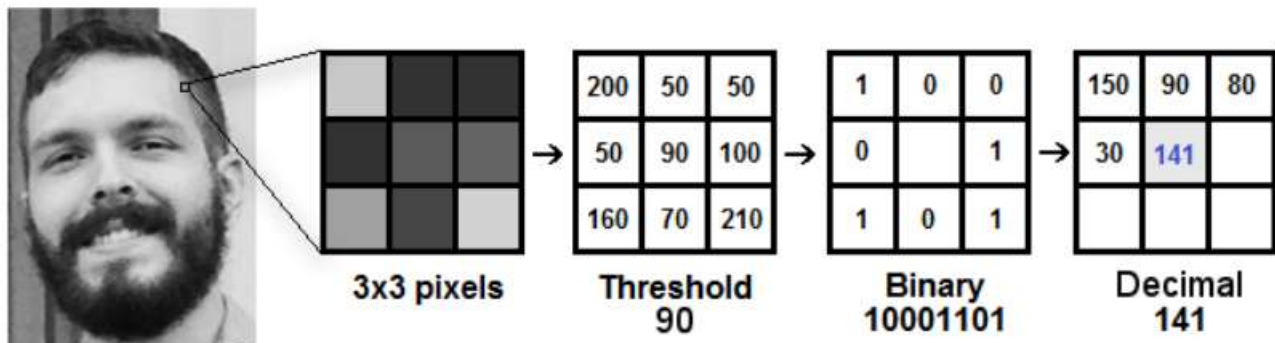


Figure 1.3 Example of LBPH

Based on the image above, let's break it into several small steps so we can understand it easily:

- Suppose we have a facial image in grayscale.
- We can get part of this image as a window of 3x3 pixels.

- It can also be represented as a 3x3 matrix containing the intensity of each pixel (0~255).
- Then, we need to take the central value of the matrix to be used as the threshold.
- This value will be used to define the new values from the 8 neighbors.
- For each neighbor of the central value (threshold), we set a new binary value. We set 1 for values equal or higher than the threshold and 0 for values lower than the threshold.
- Now, the matrix will contain only binary values (ignoring the central value). We need to concatenate each binary value from each position from the matrix line by line into a new binary value (e.g. 10001101). Note: some authors use other approaches to concatenate the binary values (e.g. clockwise direction), but the final result will be the same.
- Then, we convert this binary value to a decimal value and set it to the central value of the matrix, which is actually a pixel from the original image.
- At the end of this procedure (LBP procedure), we have a new image which represents better the characteristics of the original image.
- **Note:** The LBP procedure was expanded to use a different number of radius and neighbors, it is called Circular LBP.

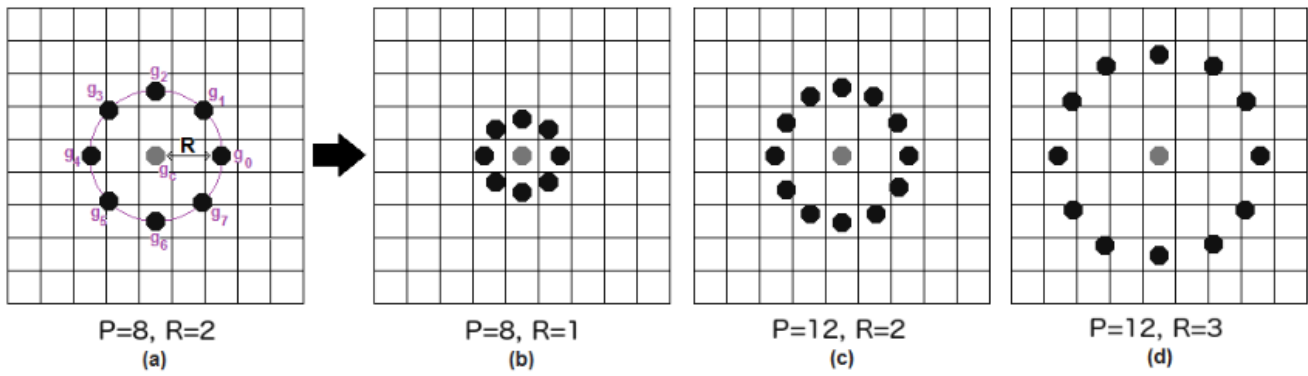


Figure 1.4 Circular LBH

It can be done by using **bilinear interpolation**. If some data point is between the pixels, it uses the values from the 4 nearest pixels (2x2) to estimate the value of the new data point.

1.3.2 Viola-Jones Face Detection Technique(Haar Cascades)

It is an Object Detection Algorithm used to identify faces in an image or a real time video. The algorithm uses edge or line detection features proposed by Viola and Jones in their research paper “Rapid Object Detection using a Boosted Cascade of Simple Features” published in 2001. The algorithm is given a lot of positive images consisting of faces, and a lot of negative images not consisting of any face to train on them. The model created from this training is available at the OpenCV GitHub repository

The repository has the models stored in XML files, and can be read with the OpenCV methods. These include models for face detection, eye detection, upper

body and lower body detection, license plate detection etc. Below we see some of the concepts proposed by Viola and Jones in their research.

The haar feature continuously traverses from the top left of the image to the bottom right to search for the particular feature. This is just a representation of the whole concept of the haar feature traversal. In its actual work, the haar feature would traverse pixel by pixel in the image. Also all possible sizes of the haar features will be applied.

Depending on the feature each one is looking for, these are broadly classified into three categories. The first set of **two rectangle features** are responsible for finding out the edges in a horizontal or in a vertical direction (as shown above). The second set of **three rectangle features** are responsible for finding out if there is a lighter region surrounded by darker regions on either side or vice-versa. The third set of **four rectangle features** are responsible for finding out change of pixel intensities across diagonals.

Now, the haar features traversal on an image would involve a lot of mathematical calculations. As we can see for a single rectangle on either side, it involves 18 pixel value additions (for a rectangle enclosing 18 pixels). Imagine doing this for the whole image with all sizes of the haar features. This would be a hectic operation even for a high performance machine.

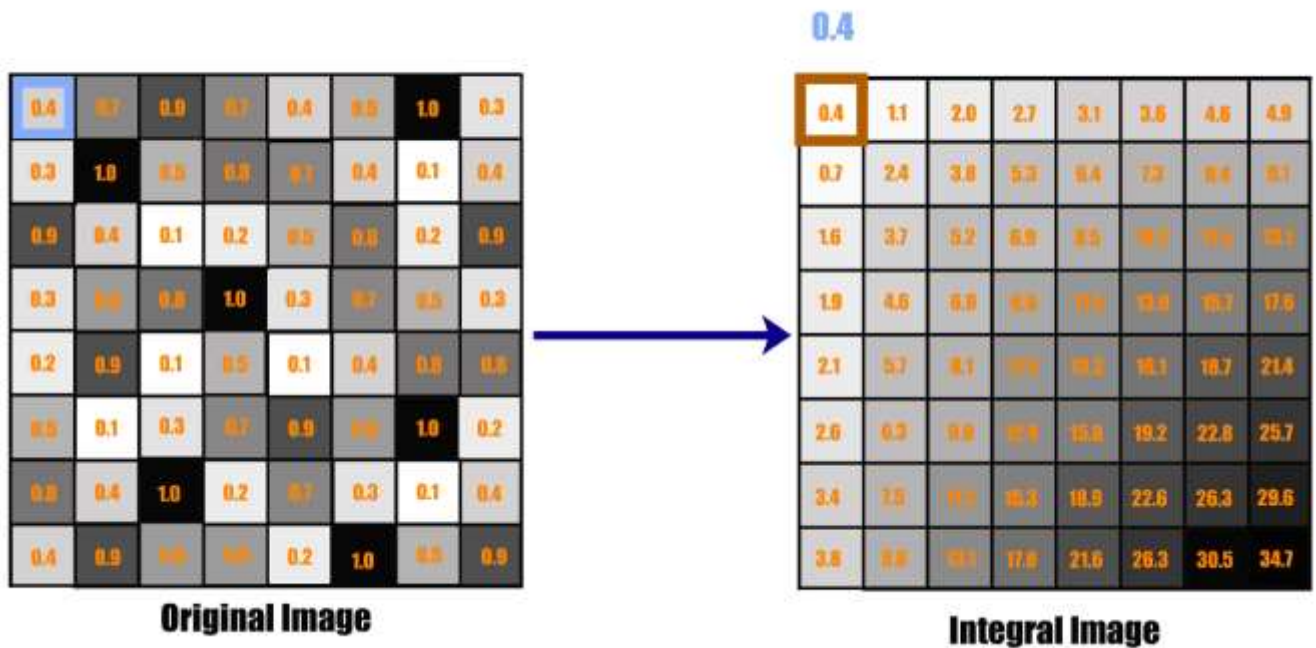


Figure 1.5 Integral Image

To tackle this, they introduced another concept known as **The Integral Image** to perform the same operation. An Integral Image is calculated from the Original Image in such a way that each pixel in this is the sum of all the pixels lying in its left and above in the Original Image. The calculation of a pixel in the Integral Image can be seen in the above GIF. The last pixel at the bottom right corner of the Integral Image will be the sum of all the pixels in the Original Image.

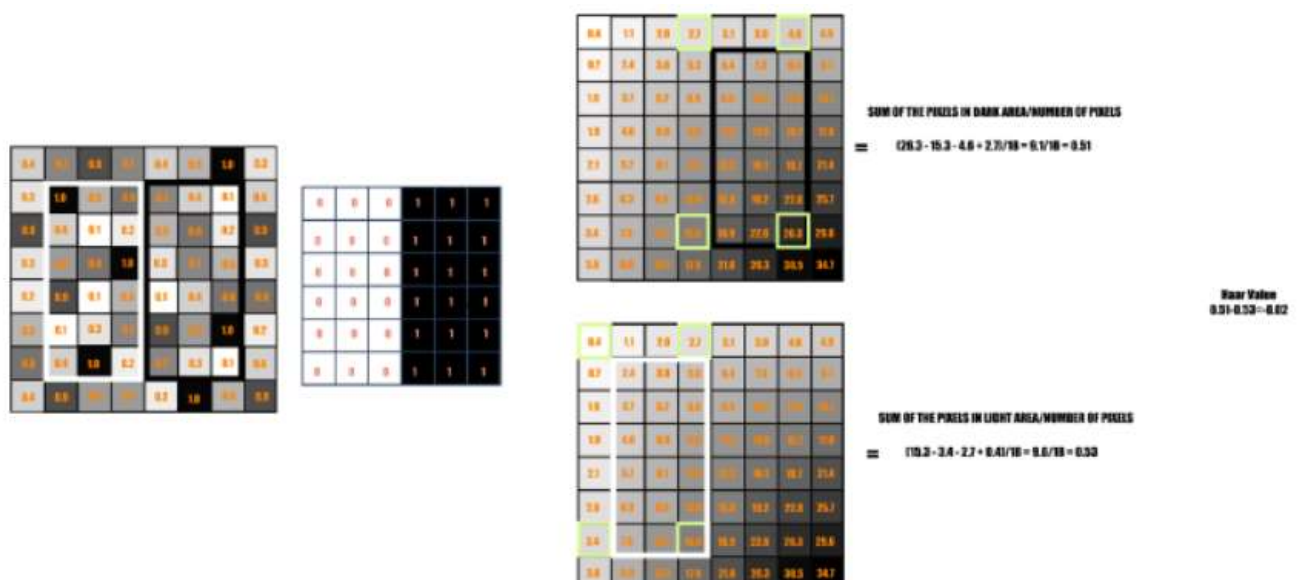


Figure 1.6 Integral Image is used here to calculate the haar value

With the Integral Image, only 4 constant value additions are needed each time for any feature size (with respect to the 18 additions earlier). This reduces the time complexity of each addition gradually, as the number of additions does not depend on the number of pixels enclosed anymore.

In the above image, there is no edge in the vertical direction as the haar value is - 0.02, which is very far from 1. Let's see one more example, where there might be an edge present in the image.

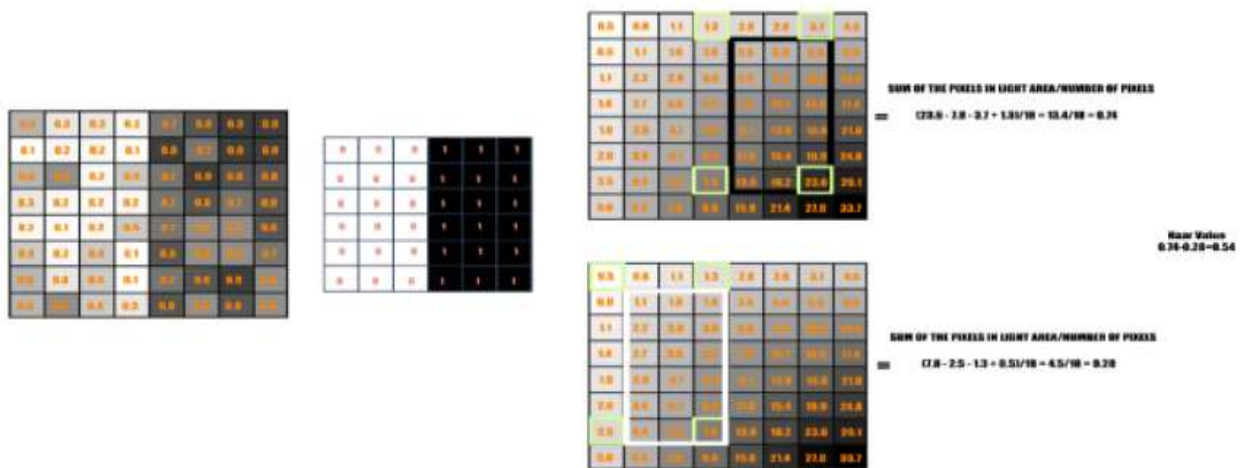


Figure 1.7 Exceptional case while calculating Haar value

CHAPTER 2

LITERATURE SURVEY

2.1 LITERATURE REVIEW

2.2.1 FACE RECOGNITION BASED AUTOMATED STUDENT ATTENDANCE SYSTEM

The approach performs face recognition-based student attendance system. This method is also similar to others and begins with the input of an image either loaded from memory or from camera. Then it pre-processes the facial features and extracts it followed by subjective selecting and then the recognition of the facial images from known database

Pros:

The proposed approach is being trained and tested on different datasets. Yale face database which consists of one hundred and sixty-five images of fifteen individuals with multiple conditions is implemented

Cons:

- The proposed algorithm can only work with a single face.
- . Small face region gives inaccurate features, this will decreases the performance of the system

2.2.2 Real time face recognition and tracking system

It works on the idea of identifying a person's physical traits that he or she cannot change, that are distinguishable from others, that may be used for identification, and that are solely in his or her hands. Biometrics techniques such as fingerprint, hand, face, iris, retina, and voice recognition are the subject of extensive research.

Pros:

- This study aims to achieve face recognition successfully by detecting human face in real time.

Cons:

If System fails it can't be accesss

2.2.3 Implementation of face recognition algorithm for biometrics based time attendance system

The main objectives of this research are to compare the ROC (Receiver Operating Characteristics) curves in order to discover the best facial recognition algorithm (Eigenface and Fisher face) provided by the Open CV 2.4.8 and to incorporate it into the attendance system as the main case study.

Pros:

Eigenface, which is integrated into the Attendance System, returns a likeness of 70% to 90% for legitimate face images.

Cons:

The results are not reliable compared to any other projects.

2.2.4 Face Detection and Recognition for Automatic Attendance System

Onur Sanli, Bahar Ilgen, Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 868)

Human facial recognition is significantly used in biometric verification.

The methods for utilising physical features such as the human body have evolved since the introduction of image processing technologies.

face has undergone a significant transformation.

The use of human facial recognition for verification is frequent, especially when individuals attend lectures.

Attendance confirmations done the old way waste a lot of time. An Attendance System with Face Recognition was designed to remedy this time loss, and it automatically preserves

Pros:

Exploit an RGBF modality to capture motion salient regions in the RGB images corresponding to action activity.

Cons:

The results are not up to the mark, hence is not applicable for long term purposes.

2.2.5 Face Recognition based smart attendance system using IOT

The suggested system makes use of the OpenCV library.

It's a free, open-source computer vision library that can be used both academically and commercially. It has interfaces for Windows, Linux, MacOS, iOS, and Android, as well as C++, Python, and Java. It places a strong emphasis on real-time applications.

he library contains over 2500 efficient algorithms that can be used to detect recognise faces, identify objects, and so on.

Pros:

The project gives solutions to two major challenges for low light condition.

Cons:

The project is fundamentally not satisfying the problem of the Face

2.2.6 Automatic Attendance Management System Using Face

Recognition

The method uses an information theory approach to decompose face images into a limited set of typical feature images known as Eigen faces, which may be thought of as the basic components of the initial face image training set.

Recognition is achieved by projecting a new image over the subspace covered by the Eigen faces, then classifying the face by comparing its position in the face space to the placements of known people.

The technology can recognize familiar faces as well as learn to recognize new faces in photographs.

In terms of speed, simplicity, and accuracy, this scheme's Eigen faces approach outperforms other face recognition systems.

The kids' attendance status.

Pros:

Proper Results in low light condition

Cons:

Inaccurate results came on several instances

CHAPTER 3

AIM AND SCOPE OF THE PRESENT INVESTIGATION

3.1 PROBLEM STATEMENT

Traditional student attendance marking technique is often facing a lot of trouble. The face recognition student attendance system emphasizes its simplicity by eliminating classical student attendance marking technique such as calling student names or checking respective identification cards. There are not only disturbing the teaching process but also causes distraction for students during exam sessions. Apart from calling names, attendance sheet is passed around the classroom during the lecture sessions. The lecture class especially the class with a large number of students might find it difficult to have the attendance sheet being passed around the class. Thus, face recognition student attendance system is proposed in order to replace the manual signing of the presence of students which are burdensome and causes students get distracted in order to sign for their attendance. Furthermore, the face recognition based automated student attendance system able to overcome the problem of fraudulent approach and lecturers does not have to count the number of students several times to ensure the presence of the students.

Hence, there is a need to develop a real time operating student attendance system which means the identification process must be done within defined time constraints to prevent omission. The extracted features from facial images which represent the identity of the students have to be consistent towards a change in background, illumination, pose and expression. High accuracy and fast computation time will be the evaluation points of the performance.

3.2 AIM OF PROJECT

The objective of this project is to develop face recognition based automated student attendance system. Expected achievements in order to fulfill the objectives are:

- To detect the face segment from the video frame.
- To extract the useful features from the face detected.
- To classify the features in order to recognize the face detected.

- To record the attendance of the identified student.

3.3 OBJECTIVES

The main objective of this project is to develop face recognition based automated student attendance system. In order to achieve better performance, the test images and training images of this proposed approach are limited to frontal and upright facial images that consist of a single face only. The test images and training images have to be captured by using the same device to ensure no quality difference. In addition, the students have to register in the database to be recognized. The enrolment can be done on the spot through the user-friendly interface.

3.4 EXISTING SYSTEM

Attendance is marked according to RFID tag. The status of student attendance can be retrieved by pressing the status button interfaced to the microcontroller, it reads the data and verifies it with the data stored in the microcontroller from the 8051 family.

Disadvantages of existing system

- The Existing Method of attendance tracking is old and Not Efficient.
- The present system is not capable of tracking attendance if RFID is lost.
- Anyone can misuse RFID and put false attendance of someone else.

3.5 PROPOSED SYSTEM

In this proposed project an automated attendance marking and management system is proposed by making use of face detection and recognition algorithms. This proposed system aims to develop an automated system that records the student's attendance by using facial recognition technology. The main objective of this work is to make the attendance marking and management system efficient, time saving, simple and easy

Advantages of proposed system

- ☐ Easy way to mark the attendance.
- ☐ The system saves the time for attendance marking.
- ☐ Convenience and Social Acceptability.
- ☐ One of the most inexpensive biometric.
- ☐ Prevents data loss.

CHAPTER 4

EXPERIMENTAL OR MATERIALS AND METHODS

4.1 ARCHITECTURAL DIAGRAM

The architectural diagram is shown in

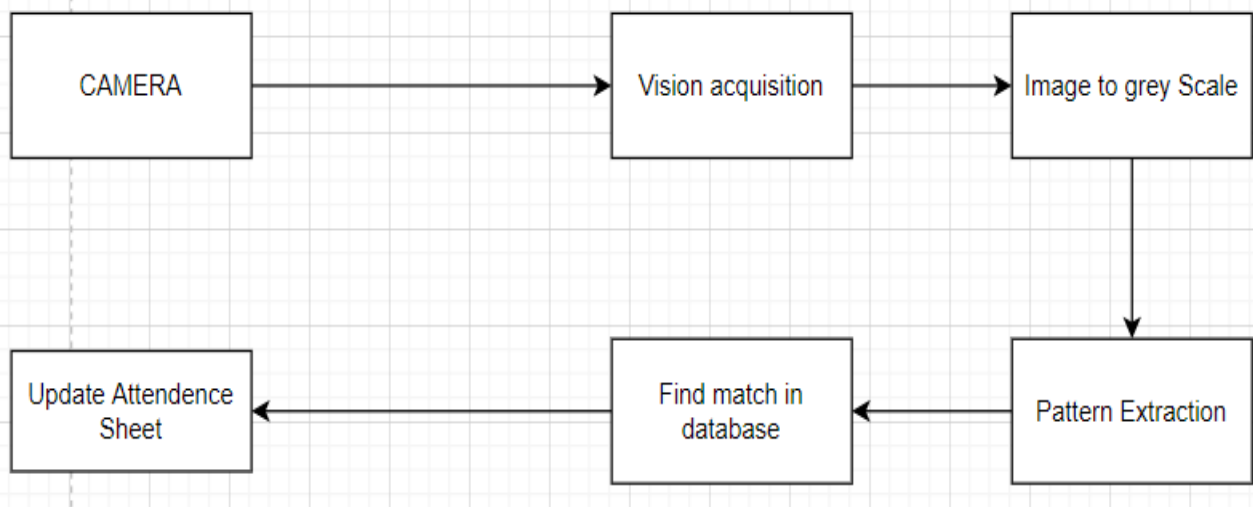


Figure 4.1 Face detection architecture

WORKING

In this project, we will be designing a hand gesture recognition-based home automation system. The initial step would be to collect the datasets of the faces of all registered people living in the house. Where only when the face of the person is recognized the hand gestures of the person are the accepted. will. The next step is to collect the dataset of different gestures by taking pictures of hands and collecting from various resources from internets. so, both these datasets are them trained by raspberry pi or the pc to identify the faces and particular gestures in order to switch on and off the appliances. so, initially raspberry pi will be configured with raspbian OS, it will be given with OpenCV libraries which will be used to trained the model in order to recognize the gestures. A camera module will be interfaced with raspberry pi/ PC system which will lively stream the gestures shown

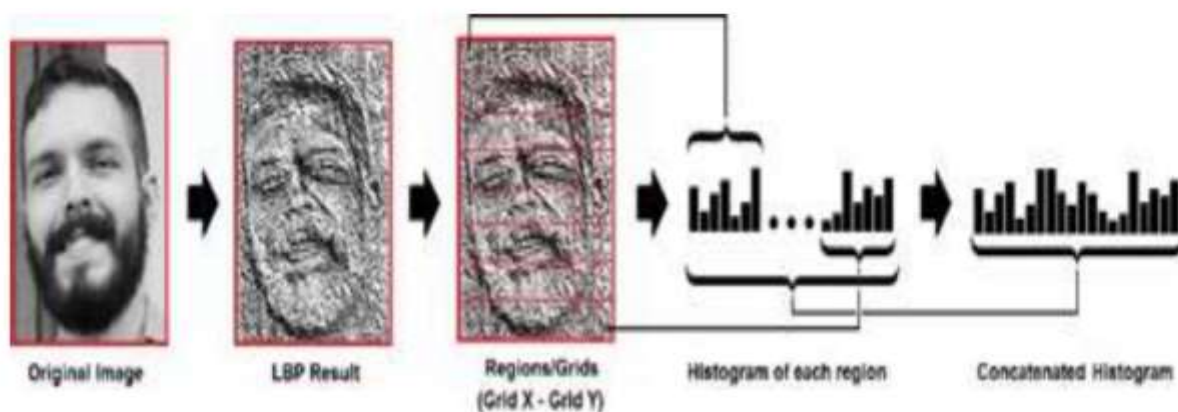


Figure 4.2 Calculation in LBPH Algorithm

in front of it. These gestures are captured and given to the raspberry pi which will analyses it to switch on and off the appliances. From the dataset collected initially we will train the model and preprocess the gestures in order to get the approximate output. A driver circuit with a relay is also connected to the raspberry pi which will switch on and off high voltage appliances. Whenever the camera gives a face input, and then accepts the hand gesture input only if the face is recognized and then compares as to which appliance should be switched on based on that particular gesture. From this model we will be able to control appliances without any internet connection using artificial intelligence.

4.2 MODULES DESCRIPTION:

- Admin login page
- Manage Employee
- Train the Data
- Photo Samples
- Extract Embeddings
- Face Recognizer
- Attendance Report
- Admin Account
- Exit

4.2.1 Admin Login Page:

It is the login page, used for authentication of the user. It asks username and password after verifying the main page for the attendance system opens.

4.2.2 Manage Employee

In this module, it shows the all information about every employee associated to them. Apart from that, in this field we also have four button to manipulate the dataset:

- Add: This button is used for adding new dataset to the database. After filling all the required set for data. One has to click on the add button. After that camera

opens automatically and 50 framesets are captured of the individual and a message pop up saying 'All photos captured'.

- Update: This button is used to update any dataset. After updating dataset it ask for confirmation then a message pop up 'Photos and database updated Successfully'.
- Delete: This Button is used for deleting any dataset from the database.
- Clear: This Button is used for clearing the input field.

The screenshot shows a web application titled "Management of Employee". On the left is a "Manage Employee" form with fields for Employee ID, Post (set to "manager"), Full Name (set to "Nisha"), Gender (set to "Female"), Contact No (set to "8765432190"), and Email Address (set to "nisha@gmail.com"). Below the form are buttons for "Add", "Update", "Delete", and "Clear". On the right is a table with columns: Employee ID, Post, Full Name, Gender, Contact No, Email Address, and Date Of Join. The table contains 7 rows of employee data.

Employee ID	Post	Full Name	Gender	Contact No	Email Address	Date Of Join
5	fr	Sonali Gupta	Female	880438528	sonali@gmail.com	2021-11-18
6	fr	nity	Female	880654321	nity@gmail.com	2021-11-18
8	hdy	dyfi	Male	9876543210	dyfi@yon.com	2021-11-18
9	SE	Painneka	Female	9876504321	pari@gmail.com	2021-11-18
10	SE	Abhishek	Male	8976123450	Avi@gmail.com	2021-11-19
11	hgyr	kgayn	Male	9876543210	ast@jkgk.vch	2021-11-19
12	accountant	Sonali	Female	9771049911	sona@gmail.com	2021-11-24

Figure 4.3 Add Record

This screenshot shows the same web application as Figure 4.3, but with a confirmation dialog box overlaid on the table. The dialog box has a blue header with an information icon and the text "All photos are collected". It has an "OK" button at the bottom right. The background form and table are slightly dimmed.

Figure 4.4 Delete Record

4.2.3 Train The Data

Here the model is trained. After training the model the message pop 'Model trained Successfully'.



Figure 4.5 Train the data

4.2.3 Photo Samples:

Here we can access the location where all the captured images are stored and view the pictures.



Figure 4.6 Photo Sample

4.2.5 Extract Embeddings:

Embedding is learning technique of the machine, where word or phrases are mapped of real number. Here we extract the embedding for new dataset. After extracting the embedding we get the pop-up message that 'Embedding Extracted successfully'. If there is no new dataset pg. 16 and we try to extract embeddings we get pop-up that 'No new staff found. Embeddings already existed for these staff.

4.2.6 Face Recognizer:

Here after clicking on the face recognizer field, camera opens automatically and our attendance is marked automatically. And get the message pop up that “mohit your attendance is recorded”, if once attendance already recorded then get pop up message “sorry mohit. your attendance has already been recorded”.



Figure 4.7 Face Recognizer

4.2.7 Attendance Report:

Here we can see the attendance report of everyone. And also search the report according to date and name of the individuals also.

ID	Name	Date	Time	Status
3	Sonali gupta	2021-11-17	11:55:57	Present
3	Sonali gupta	2021-11-18	12:45:22	Present
3	Sonali gupta	2021-11-19	11:35:56	Present
6	rishi	2021-11-19	12:15:52	Present
4	rishi	2021-11-18	12:50:03	Present
9	Parvisha	2021-11-19	01:54:07	Present
10	Abhishek	2021-11-19	01:56:52	Present
12	Sonali	2021-11-24	07:10:12	Present
14	idylp	2021-11-24	10:55:52	Present

Figure 4.8 Attendance Report

4.2.8 Admin Report

Here we can change the username and password credential. In this module it ask new username and password after, after giving the new value. We can set new username and password credential for user.



Figure 4.9 Admin Report

4.3.9 Exit

Here we can exit from the system. On clicking on this module it ask for confirmation "Do you really want to exit" after confirming we can exit from the system.

CHAPTER 5

RESULTS AND DISCUSSIONS OF PERFORMANCE ANALYSIS

RESULT

In this proposed approach, face recognition student attendance system with user-friendly interface is designed by using MATLAB GUI (Graphic User Interface). A few buttons are designed in the interface, each provides specific function, for example, start button is to initialize the camera and to perform face recognition automatically according to the face detected, register button allows enrolment or registrations of students and update button is to train the latest images that have been registered in the database. Lastly, browse button and recognize button is to browse facial images from selected database and recognized the selected image to test the functionality of the system respectively. In this part, enhanced LBP with radius two is chosen and used as proposed algorithm. The analysis of choosing the radius size will be further explained in the discussion.

DISCUSSIONS

This proposed approach provides a method to perform face recognition for student attendance system, which is based on the texture based features of facial images. Face recognition is the identification of an individual by comparing his/her real-time captured image with stored images in database of that person. Thus, training set has to be chosen based on the latest appearance of an individual other than taking important factor for instance illumination into consideration. The proposed approach is being trained and tested on different datasets. Yale face database which consists of one hundred and sixty-five images of fifteen individuals with multiple conditions is implemented. However, this database consists of only grayscale images. Hence, our own database with color images which is further categorized into high quality set and the low quality set, as images are different in their quality: some images are blurred while some are clearer. The statistics of each data set have been discussed in the earlier chapter. Viola-Jones object detection

framework is applied in this approach to detect and localize the face given a facial image or provided a video frame. From the detected face, an algorithm that can extract the important features to perform face recognition is designed. Some pre-processing steps are performed on the input facial image before the features are extracted. Median filtering is used because it is able to preserve the edges of the image while removing the image noises. The facial image will be scaled to a suitable size for standardizing purpose and converted to grayscale image if it is not a grayscale image because CLAHE and LBP operator work on a grayscale image. One of the factors that are usually a stumbling stone for face recognition performance is uneven lighting condition. Hence, many alternatives have been conducted in this proposed approach in order to reduce the non-uniform lighting condition. Before feature extraction takes place, pre-processing is performed on the cropped face image (ROI) to reduce the illumination problem.^{36 47} In the previous chapters, Contrast Limited Adaptive Histogram Equalization (CLAHE) is proposed in pre-processing in order to improve the image contrast and reduce the illumination effect. Most of the previous researchers have implemented histogram equalization in their approach. In order to study the difference between the CLAHE and histogram equalization, comparison is made and tabulated in Table 4.2. For the comparison, our own database and Yale face database are used. From the result tabulated, CLAHE appears to perform better compared to histogram equalization. From the image of our own database, the left hand side of the original image appears to be darker compared to right hand side. However, histogram equalization does not improve the contrast effectively, which causes the image remains darker at left hand side. Unlike histogram equalization, CLAHE appears to improve the contrast more evenly throughout the entire facial image. This could help to reduce uneven illumination. In Yale face database, CLAHE prevents some region appears to be washed out as well as reduce over enhancement of noise. Besides, CLAHE shows a clear edge and contour compared to histogram equalization. In addition, by referring to the histograms, the pixel is widely span over the intensity scale axis 0 to 255 for CLAHE whereas for histogram equalization the pixel span from 0 to only about 200 over the intensity scale axis. Hence, it can be said that the contrast of the image is more evenly improved throughout the image by CLAHE compared to histogram equalization based on the result obtained. After pre-processing, useful feature is extracted by using enhanced LBP (local Binary pattern). Unlike the original LBP operator, enhanced LBP operator consists of different radius size is proposed as mentioned in previous chapters. This different radius size enhanced LBP operator is less affected by uneven lighting compared to original LBP operator. The extracted feature for different radius is

shown and tabulated in Table 4.3. The results show when the radius increased, the images are smoothen. For evaluation purpose, Yale face database with different condition is used for comparison. The normal facial image of each individual in Yale face database is trained and the facial images with varying condition is input as the test image. The recognition rate with the different radius size of LBP operator is computed and tabulated in Table 4.4.37 48 From the Table 4.4, when the radius size increase, only facial images with conditions right light, left light and center light are affected whereas for the other conditions the recognition rate remains constant. This shows that by increasing the radius, uneven lighting effect can be reduced without distorting the detail of the image. From Figure 4.6, the line graph shows that the accuracy of different light conditions increase when radius increases. In addition, it shows that among the different lighting conditions, the system work the best in left light condition followed by center light condition and the last is right light condition. The recognition rate of LBP operator with different radius is then computed by using our own database. However, LBP operator with different radius does not give significant results because there is no critical illumination problem exists in the images of our own database. Hence, the pixels of good quality images of our own database are modified to generate the illumination effects in order to determine the impact of different size LBP operator. Figure 4.7 shows conditions I, II, III and IV which illustrate different illumination effects. By increasing the radius size, the detail information is simplified and the contour or shape of the face is emphasized. This illustrates that some of the useless or redundant information is removed and more emphasis is on the critical details for recognition. As it is proven any increasing radius LBP performs better compared to original by reducing illumination effect, consistency of the system is also emphasized other than accuracy of the system. From the Table 4.5, although radius three and radius four have higher average accuracy compared to radius two, radius two is more consistent toward different conditions. As the conditions I, II, III and IV is self-simulated conditions, in real time face recognition, the illumination condition is unpredictable. Hence, radius two gives consistent result which is (94.12 %) in condition I, condition III and condition IV is chosen and used as proposed algorithm.

5.1 Comparison of LBP and PCA

In this proposed approach, PCA face recognition is performed in order to identify the differences with respect to LBP by using the same database. From the result obtained in

Table 4.7, supposedly PCA should have worked better with high quality images which is similar to enhanced LBP. However it gives slightly lower accuracy in recognition in high quality images compared to low quality images. This is due to different size of the database are used in the proposed approach. For high quality images there are only seventeen students in the database, whereas low quality images involve twenty-six students, which is almost ten students more than high quality images. It is the PCA's nature to be more affected by the size of the database compared to LBP. Hence, the larger the size of the database which means the more students include in the database, the lower the recognition rate of PCA. Furthermore, the enhanced LBP is compared with the PCA face recognition, by using the same pre-processing procedure and same image enhancement technique. From the Table 4.6 and Table 4.7, the average accuracy of PCA is lower compared to the LBP in all the databases, our own database with high and low quality images and also Yale face database is used respectively. Hence, it can be said that enhanced LBP works better compared to the PCA face recognition given the same dataset is used for training and testing. An automated subjective selection algorithm involve both enhanced LBP and PCA is designed for face recognition. The best results from enhanced LBP and PCA correspondingly are compared to obtain a common result. This common result will be classified as recognized individual. By doing so, the system becomes more 51 reliable, stable and consistent not only in different expression but also in different lighting condition. This is because two algorithms are used for generalization, one act as a reference to another one. Especially in the camera initializing stage, if the camera is started faster than the lighting source, a darker image will be captured. However the dark image is meaningless to be recognized. The combination of enhanced LBP and PCA able to block the meaningless image from being recognized. Overall accuracy with and without combination of LBP and PCA are tabulated in Table 4.8. It shows that with high quality images, make no difference with or without the algorithm. However, for low quality images, it shows significant improvement in the accuracy with the algorithm.

5.2 Weakness of the Algorithm

The proposed algorithm can only work with a single face. Multiple faces appear in the same image causes each of them to be small. Small face region gives inaccurate features, this will decreases the performance of the system. Hence, whenever more than

a face is detected, the system will not perform the recognition. The LBP algorithm is highly sensitive to image quality and highly affected by the blurred image. LBP is the texture based descriptor which extracts the local grayscale features by performing feature extraction on a small region throughout the entire image. Hence, test image and train image have to be the same quality and captured by the same device in order to have high accuracy. The laptop built in webcam is the default device in this proposed approach to capture image. The webcam and lighting source of the laptop have low performance which cause the captured images appear to be darker and blurred. This cause the system only function the best if the test image and train image are both captured at the same place under approximately same illumination. Besides, false recognition occurs when the facial image is blurred. The blurred image caused by the after image created by movement will degrade the performance. The face feature extracted from the blurred image would be totally different compared to train image resulting in false recognition. In addition, if an individual wears make up in the image for face recognition, the important features will be covered. Similarly, face region should not be covered by 56 hair, beard or any accessories to ensure better performance. For instance, a girl provides a facial image with her face covered by hair, it causes false recognition to occur if the girl ties her hair. This is because anything covering the face region will be assumed as face feature. This causes a relatively large difference between test image and train image. Different level of brightness or lighting could be a challenging problem for face recognition. Hence, limitation of the proposed algorithm is studied and analysis is conducted by modifying the pixels of high quality images in order to manipulate the brightness of the facial images. The recognition rate of facial images under different level of brightness is computed and tabulated. Figure 4.12 shows images with different intensity by adding different constants to pixel. The performance of the proposed algorithm is tabulated in the Table 4.9. From the Table 4.9, the proposed algorithm function the best when the intensity increase by a constant at the range of 25 and 50. Further increasing or decreasing the intensity level out of this range will cause the recognition rate to drop to (94.12 %) .Hence, it can be said that the system work better in a relatively brighter image then a darker image.

CHAPTER 6

SUMMARY AND CONCLUSION

6.1 CONCLUSION

This product has a great future scope. It is beneficial for easily marking the attendance . “Face Recognition Attendance System” is currently based upon maintaining the attendance status of every employees by recognizing their

face as well maintaining the details of the employees. Providing a platform to easily maintain attendance system. It is easy to use and save lots of time in

marking attendance of any individuals as compared to other attendance system. This project can bring lots of value in coming future.

6.2 FUTURE ENHANCEMENT

This system can be deployed for verification and attendance tracking at various government offices and corporates. For access control verification and identification of authentic users it can also be installed in bank lockers and vaults. For identification of criminals the system can be used by police force also.

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A. SOURCE CODE

```
from tkinter import *
import cv2
import os
from tkinter.ttk import
Combobox, Treeview,
Scrollbar, Progressbar
from PIL import Image,
ImageTk
import pymysql
import csv
from tkinter import
messagebox , Message
import numpy as np
from os import listdir
from tkinter import
simplifiedialog
import time
import random
import pandas as pd
from tkinter import
filedialog
import gtts
from gtts import gTTS
from extract_embeddings
import
Extract_Embeddings
import pickle
from training import
```

```

import event_scheduler
import json
from
tensorflow.keras.preprocessing.image import
img_to_array
from
tensorflow.keras.models
import model_from_json
import tensorflow as tf
root_dir = os.getcwd()

try:
    embedding_obj =
    Extract_Embeddings(model_path =
    'models/facenet_keras.h5')
    embedding_model =
    embedding_obj.load_model()
    face_cascade =
    cv2.CascadeClassifier("models/haarcascade_frontal
    face_default.xml")

    # Load Model
    json_file =
    open('antispooofing_models
    /finalyearproject_antispooofing_model_mobilenet.json',
    'r')
    loaded_model_json =
    json_file.read()
    json_file.close()

```

```

liveness_model =
model_from_json(loaded_
model_json)
    # load weights into new
model

liveness_model.load_weig
hts('antispooofing_models/fi
nalyearproject_antispooofin
g_model_74-0.986316.h5')
    print("Liveness Model
loaded successfully from
disk")

except cv2.error as e:

```

```

        print("Error: Provide correct path for face detection model.")
        sys.exit(1)
except Exception as e:
    print("{}".format(str(e)))
    sys.exit(1)
##### Admin
Login page #####
face = Tk()
face.title("Admin Login Page")
face.geometry("1270x700+0+0")
face.iconbitmap("Photos/Aha-Soft-Free-Large-Boss-
Admin.ico")
    ## variables for login##
username_var = StringVar()
password_var = StringVar()
oldpass_var = StringVar()
user_var = StringVar()

```

```

newpass_var = StringVar()
def login():
    if username_var.get()
== "" password_var.get()
== "":

```

```

messagebox.showerror('Er
ror','All the fields are
required', parent = face)
else:
    try:
        conn =
pymysql.connect(host =
'localhost', user = 'root',
password =

```

```

", database = 'recognition')
        curr = conn.cursor()
        curr.execute('select * from login where username = %s
and password = %s',(username_var.get(),
password_var.get()))
        row = curr.fetchone()
        if row == None:
            messagebox.showerror('Error','Invalid Data')

        else:
            face.destroy()
            def manage_employee():
                try:
                    conn = pymysql.connect(host = "localhost", user
= "root", password = "", database = "recognition")
                    cur = conn.cursor()
                    first = Toplevel()
                    first.iconbitmap("Photos/Bokehlicia-Captiva-
System-users.ico")
                    first.geometry("1270x700+0+0")

```

B. PUBLICATION WITH PLAGIARISM REPORT

SECURE AND EFFICIENT FACIAL IDENTIFICATION BASED ATTENDENCE SYSTEM FOR INSTITUTION

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ABSTRACT:-

Attendance is a major part of any institution in the whole world. Since older times, Attendance are taken with the help of roll call manually and marked in the register and vice versa. It is a tedious task to do given the modern age we are in right now. Since, every task is automated so why not taking attendance. Moreover, manual task involves human error which is unavoidable. In a mission to automate and modernize the attendance marking system, We created a digital attendance which marks present or absent with the help of Scanning in camera and maintaining a database in backend. This system recognize face with the help of LBPH algorithm and Haar cascading algorithms which in turn generates a facial map. The algorithm used above gives better results compared all other similar algorithms available. Defining whole requirement and management is defined as a necessary step in the developing the successful software projects and systems. The "Face Recognition System" is taken as a project title to develop a system on relevant technologies. The main aim of this project is maintaining attendance of the individuals by recognizing the face. This system is developed to make the attendance process easily and more efficiently as compared to manual attendance system. By using this anyone can easily mark their attendance status. This project is developed using Python and its packages for the front end. And MySQL server is used at backend for maintaining the databases.

Keywords: Attendance, Modern, Digital, Marking, Python, Mysql

INTRODUCTION

The Human identity is transmitted through the human face, which plays a vital role in our interactions with society. Biometric detection technology, which uses the human face as a key to security, has gotten a large amount of interest in recent times because of its ability to be used in a different law enforcement and non-compliance situations. Face recognition has distinct advantages over other biometrics systems that use fingerprints, palm stamps, and iris because it is a non-contact method. Without touching the target, facial photos can be acquired remotely, and identification does not necessitate interaction with the person. Furthermore, because captured and archived images can later be used to identify a person, facial recognition aids in crime prevention.

Also, in a customary process employees must enter information manually into the manual or booklet Institutional web page. This involves time and duplication work for the people involved [6], [7]. into the manual or brochure Institutional web page. Many experts have developed a variety of methods for obtaining existence based on facial recognition algorithms over the years, including Local Binary Pattern (LBP), which uses OpenCV, an open source computer database, but here we discuss Local Binary Pattern Histograms (LBPH), which has good accuracy and effective facial expressions recognition [8].

In general, the travel plan can be separated into two categories.

Attendance System by Hand (MAS) System of Automatic Attendance (AAS)

The Manual Attendance System is a call system in which students are asked to offer their own presence. However, there are times when a student makes a false visit to a buddy, and many cases will not be examined by employees due to overwork or a haste to begin a class owing to time constraints. To solve the above problem build an Automated Availability System that combines biometric scanning and id card scanning. Build an Automated Availability System that uses biometric scanning and id card scanning to solve the aforesaid problem. The issue with this type of automatic presence system is that students must wait a long time for lines to mark their presence; biometrics is irrational, but there are hidden concerns about these systems; on the other hand, id card scanning also has issues with false presence, and it can be difficult for a student to be present if he or she loses his or her identity document [9], [10].

On the other side, the Facial Recognition System (FRS) will scan each person individually and process the image acquired. Attendance is being tracked using artificial intelligence. There is a possibility of false marking because the system uses artificial intelligence.

There would be none, and the system would automatically save the face identifications for that person, boosting the efficiency of the system [11]. As a result, FRS is being used in this study to keep track of attendance Algorithms.

Literature Review:

FACE RECOGNITION BASED AUTOMATED STUDENT ATTENDANCE SYSTEM

CHIN HOWARD, UNIVERSITY TUNKU ABDUL RAHMAN, 2018

This method uses facial recognition to offer a student-centered approach. This method, like the others, begins with the insertion of an image or the uploading of an image to a memory or camera. It then prepares and extracts facial traits, followed by an independent selection and recognition of facial photos from a well-known website.

The proposed method is trained and tested on various databases. Yale face website containing 165 photos of 15 people with multiple terms is in use.

The proposed algorithm can only work with one face. The smaller face region provides the wrong features, this will reduce system performance.

Real time face recognition and tracking system

Muhammet Baykara, Resul Das, Department of Software Engineering, Elazığ, Turkey-2014

It works on the idea of identifying a person's physical traits that he or she cannot change, that are distinguishable from others, that may be used for identification, and that are solely in his or her hands. Biometrics techniques such as fingerprint, hand, face, iris, retina, and voice recognition are the subject of extensive research.

The goal of this research is to detect a human face in real time and successfully recognise it.

It is not possible to access the System if it fails.

Implementation of face recognition algorithm for biometrics based time attendance system

The main objectives of this research are to compare the ROC (Receiver Operating Characteristics) curves in order to discover the best facial recognition algorithm (Eigenface and Fisher face) provided by the Open CV 2.4.8 and to incorporate it into the attendance system as the main case study.

Eigenface, which is integrated into the Attendance System, returns a likeness of 70% to 90% for legitimate face images.

A key weakness in the algorithm is that it fails to recognise the twin person.

Face Detection and Recognition for Automatic Attendance System

Ömer Sanli, Bahar Ilgen, Part of the Advances in Intelligent

Systems and Computing book series (AISC, volume 868)

Human facial recognition is significantly used in biometric verification.

The methods for utilising physical features such as the human body have evolved since the introduction of image processing technologies.

face has undergone a significant transformation.

The use of human facial recognition for verification is frequent, especially when individuals attend lectures. Attendance confirmations done the old way waste a lot of time. An Attendance System with Face Recognition was designed to remedy this time loss, and it automatically preserves the kids' attendance status.

Face Recognition based smart attendance system using IOT

Sakshi Patel, Prateek Kumar, Sheesh Garg, Ravi Kumar, Department of ECE, Jaypee University of Engineering and Technology, Madhya Pradesh, India-2018

The suggested system makes use of the OpenCV library. It's a free, open-source computer vision library that can be used both academically and commercially. It has interfaces for Windows, Linux, MacOS, iOS, and Android, as well as C++, Python, and Java. It places a strong emphasis on real-time applications.

The library contains over 2500 efficient algorithms that can be used to detect and recognise faces, identify objects, and so on.

Automatic Attendance Management System Using Face Recognition

Jomon Joseph, K. P. Zacharia, M.Tech (By Research) Scholar, Anna University, Coimbatore, Jothipuram, Coimbatore, India-2013

The method uses an information theory approach to decompose face images into a limited set of typical feature images known as eigenfaces, which may be thought of as the basic components of the initial face image training set.

Recognition is achieved by projecting a new image over the subspace covered by the Eigen faces, then classifying the face by comparing its position in the face space to the placements of known people.

The technology can recognise familiar faces as well as learn to recognise new faces in photographs.

In terms of speed, simplicity, and accuracy, this scheme's Eigenfaces approach outperforms other face recognition systems.

Student Attendance Recording System Using Face Recognition with GSM Based

Mr.C.S.Patil, Mr.P.R.Karhe, Mr.M.D.Jain, E&TC, E&TC, E&TC, Position: Head of department, Assistant Professor, Lecturer-2014

Students flash their cards at the RFID scanner as soon as they enter the classroom in order to collect student attendance in a semiautomated manner.

In contrast, the RFID-based student attendance system requires students to physically handle the RFID card each time they attend a class. It's a wireless technology that displays actions in real time, resulting in enhanced efficiency and accuracy with less human data entry duties.

PROPOSED WORK

The technique is suitable for facial recognition and artificial intelligence. Continuous observation aids in assessing and improving the performance of participants. This program's functionality is determined by the post. The ability to recognize and mark the presence of a suitable individual in a picture, many photographs are taken in order to assess the contour of each person's face and to build a library that can be used effectively.

Architecture Diagram:

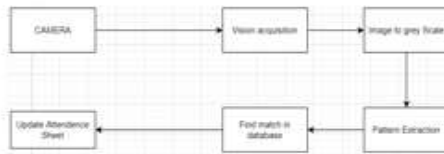


Fig. 2 Architecture Diagram

Module Description

A) Description of Block Diagram

The first step is to scan the area (classroom) for faces, after which the image scanner (camera) will detect the faces in the classroom and capture multiple images, after which the image is processed by software using artificial intelligence to recognise the images, and finally the right individual's attendance is marked.



Fig. 3 Block diagram for Facial Recognition Attendance System

MODULES

- Capture Photo
- Recognition of face
- Image capture
- Image Processing and Face recognition
- Attendance marking
- Communication Module

Capture Photo:

When students enter the classroom, a camera is fixed inside the room and focused on the student's seating position, capturing the student's image for the face detection process that follows.

Recognition of face:

Face detection to assist in identifying he/she for image capture. For a student image, find the haar cascading classifier.

Image capture:

Improve image input and improve image quality because

they have converted RGB image to Gray Scale image because LPB algorithm does not detect RGB image.

Image Processing and Face recognition:



Fig. 4 Extract and Save Embeddings

An important part of facial recognition is the automatic method of identifying and verifying the captured image.

Attendance Marking

If a timestamp is available that is similar to the related student data, this module will mark the student's presence on the website with a timestamp.

Communication Module

This module sends information at the end of the day to the email id of students and their parental cell phone number

Data Set

The Haar Cascading Algorithm will employ the data set, which is a vital function in FRS. If a taken image includes numerous faces, this technique requires many photographs of a person to train an algorithm to identify the correct person. Individual faces are detected using the front face algorithm in the Haar cascading algorithm. This data set is also utilised to employ the LBPH technique to compare the image to the one captured during the presence session. Because the method can recognise RGB images directly, images captured with RGB will always be transformed to greyscale and preserved.

Face detection using Haar Cascades Classifier

It's a stage in which cascade activity is honed by focusing more on a positive picture than a negative one. Haar characteristics and integrated pictures are used. Assists in face recognition and retrieval in the future.

The Haar cascades have three distinct characteristics:

1. Unique characteristics of the edges
2. Line characteristics
3. The elements of the centre surround

Integral Image Posture detection using Haar like features

The critical image (Figure 3.) in the pixel area (x, y) contains the total number of pixels above and to the left of the pixel, aggregate, complete images are the fastest among all the features we have listed, most in which insignificant images are considered to be two-dimensional images. The first place to concentrate on is the individual eye area, which is often dark, followed by the nose and cheeks, and finally the eyes and the bridge of the nose. However, the same pixel windows that operate on the cheeks and elsewhere are irrelevant.

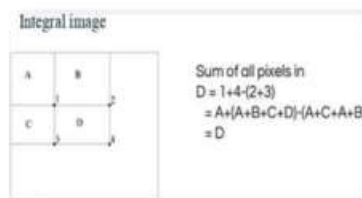


Fig. 5 Internal Image Adaptive boost training

Because the work is based on a machine-wise design platform, it must adapt to natural rather than man-made conditions, so flexible reinforcement training should be performed in the system to identify the correct image. This is done in a few steps, as the machine selects only the essential elements, reducing performance time. The method builds a solid separator by combining numerous weak parts, then moves the target picture across the embedded image and creates dividers in each region.

They concentrate on the picture in order to determine if it is the proper one; the entire process is based on a system that follows the Haar cascading method; if the system detects the correct image, it moves on to the next procedure until it does so. The iteration process continues.



Fig. 6 Face Recognition

LOCAL BINARY PATTERN HISTOGRAM

The Local Binary Pattern Histogram (LBPH) method is used in this recommendation system to recognise individual faces. The texture of a rectangular block is described by the word LBP. As a pattern called LBP, enter the code at each position in the block. How to calculate how gradient shapes appear in different regions of a picture. Point P and its eight neighbours, which are in an R-diameter circle, constitute the core element of the LBP code text.

4 Parameters used by LBPH:

The radius at which the circular local binary patterns are built. The larger the radius, the more sample points are needed to create the circular local binary pattern; an optimal value of 8 sample points is chosen.

The number of sample points used to create the circular local binary pattern is called neighbours. Normally, it is set to 8.

Grid X is the ratio of horizontal vectors to cells in the grid. The local binary pattern is circular. Normally, it is set at 8 sample points.

The number of cells to vertical vectors in the grid Y. The local binary pattern is circular. Normally, it is set at 8 sample points. The local binary pattern histogram is a simple but very

effective texturing function that identifies picture pixels by saching the pixel's limit, processing the result as a binary value, and visualising the result as histograms. The algorithm's accuracy is quite good, implying that LBPH separated is a well-functioning and precise face.

of any individuals as compared to other attendance system. This project can bring lots of value in coming future.

We must first train the LBP algorithm. In order to accomplish so, we look at a face image in the data set. We must place the photographs in an id with a unique name, so that the algorithm can recognize and mark the proper id and name using the images in the same id and name. The first stage in bringing the center image to life is to emphasize face characteristics. We have a grey facial picture of 3x3 pixels.

Represents the thickness of each pixel (0-255) as a 3x3 matrix. As a limit, we must pick the matrix's median value. The value will be utilized for new ones from eight neighbors, and the average value of each neighbor is referred to as a threshold. New matrix values, such as 1 high values and low threshold matrix values, solely include binary values.

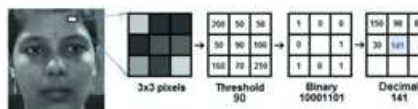


Fig. 7 Example of LBPH

RESULTS

is a mission to automate the task of taking attendance manually, this project is implemented. This project saves time for the lecturer by taking attendance and updating the attendance record on its own. So that more time may be devoted to the subject for a deeper grasp. Furthermore, while updating the student report and stating is/her attendance record, it will be simple to sort the attendance based on the student roll no. and name. We may evaluate the student attendance record with an algorithm and send a reminder letter or message to their parents if their attendance is less than 75 percent.

CONCLUSION

This product has a great future scope. It is beneficial for easily marking the attendance. "Face Recognition Attendance System" is currently based upon maintaining the attendance status of every employees by recognizing their face as well maintaining the details of the employees. Providing a platform to easily maintain attendance system. It is easy to use and save lots of time in marking attendance

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