

FACE RECOGNITION AUTOMATED ATTENDANCE MANAGEMENT SYSTEM USING MACHINE LEARNING ALGORITHM

Dr.A.Muthumari¹, *P.L.Sanu², D.Banu Priya³, S.Mohan Raj⁴,

¹(Assistant Professor, Department of Computer Science and Engineering , University College of Engineering, Ramanathapuram, Tamilnadu, India)

^{2,3,4}(Final Year, Department of Computer Science and Engineering, University College of Engineering, Ramanathapuram, Tamilnadu, India)

Abstract:

The main objective of this Face Recognition automated attendance management system (FRAAMS) is to detect and recognize faces in real time environment and mark the attendance of their students and employee on a daily basis to keep track of their presence. This system will be marked and recorded the attendance in any environment. So, in this system we are changed to FRAAMS System it will detects and recognize the Face of Students and automatically updated to the database. This system will work on time basics and save the time of the Lecturer and Administrator. Fake attendance will be Eliminated using this technique and send the SMS alert to the parents for security purpose and Monthly report will be generated and send Email to the parents. In this system will capture live images of students and preprocessing the data. It will be training the datasets to detect the faces of students and recognize using Local Binary Pattern Histogram (LBPH) Algorithm then updated the Attendance details to database using Machine Learning Techniques.

Keywords — *Haar cascade classifiers, LBPH, Face detection, Face recognition*

I. INTRODUCTION

In now a days Attendance is monitored in IT Sectors, Schools, Government office, and education institutes etc. In many Institutions are following the manual method to mark attendance and this process is very time consuming and some institutions are changed to biometric and RFID. In this methods time consuming is more and fake attendance will be possible.

So, in this system we are changed to FRAAS. It will detect and recognize the Face of Students and automatically updated to the database. The main goal is to fully automated recognition system with time basics and this system will save the time of the Lecturer and Administrator. Fake attendance will be eliminated using this technique and send the SMS alert to the parents for verification purpose and Monthly report will be generated and send Email to the parents. In this system will capture live images of students and preprocessing the data. It will be

training the datasets to detect the faces of students and recognize then updated to the database. In this system will improves the quality of the students and helps to finding the late comers, punctual of students and absentees easily.

Case 1: Face recognition technique has been used in various applications like access control, security, surveillance, computer vision etc.

Case 2: After students are coming out from home the parents are not aware of it, they are going to college or anywhere so in this system it will send the SMS alert to the parents in both FN and AN Section and Monthly report will be generated and send Email to parents.

Case 3: In this automated system it will worked on time basis the students are come in time the attendance present will be recorded otherwise out of time the attendance will be automatically updated absent for other students.

Case 4: In this system are run in Python Django Framework [web development] the students will login to the site and view their attendance daily and monthly basics. In admin will add, update, and delete the students in database.

II. LITERATURE SURVEY

Author [1] proposed Face detection using image recognition system. This system evaluates Face detection and Recognition, it provides finding for better response and high accuracy. The author [2] proposed Student Attendance Management system using face recognition based on GSM.

This system will avoid RFID and used face recognition iball (webcam) with GSM. This system uses Matlab Framework they focus on human facial aspects like eye, nose etc... 'Attendance Monitoring System Using Image Processing and Machine Learning'. This system will capture the images of students with particular time in class room the face recognition is done using convolution neural network and it will mark the attendance of recognized students in [3], proposed

Face Recognition by using LBPH technique. This system will convert the color image to grey image and extract the features of image using Haar cascade classifiers [4].

III. METHODS AND MATERIALS

In Methodology the FRAAMS is developed by using Django Framework and Machine Learning Algorithms. In Machine Learning this system uses OPENCV, LBPH and Haar cascade classifiers. Flow diagram of proposed is in figure 1.

Steps of Face Recognition Attendance system:

1. Image Preprocessing
2. Create Dataset
3. Training
4. Face Detection
5. Face Recognition

LBPH Algorithm:

In LBPH (Local Binary Pattern Histogram) technique we characterize each images in locally and we perform some operations in datasets. In this way we analyze images characterizing local patterns in each location of the image.

A formal Description of LBP operator is $LBP(x_c, y_c) = \sum_{p=1}^P \sum_{q=0}^{2^p-1} 2^p s(i_p - i_c)$.

Haar cascade classifiers:

In classifiers face detection uses Haar cascade classifiers they need more no of positive and negative images for performing the operations algorithm needs a lot of positive images and negative images to training the classifier.

Flow Diagram:

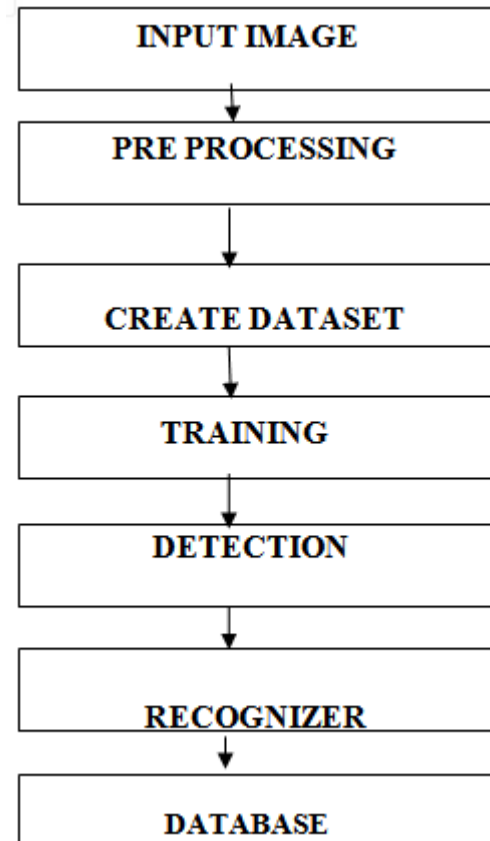


Figure 1: Flow diagram

Face Detection:

Face detection separates the facial area from the rest of the background image. It will identify the faces of human in digital. They use Haar Cascade classifiers for detection part.

Face Recognition:

In Face Recognition it matches the Webcam Live images to already stored datasets using LBPH Algorithm then stored the student attendance in to database.

Create Dataset:

In dataset part they will create more no of faces of students or employee faces in order to recognize them. In dataset are created by the Image preprocessing techniques they store with the unique id of the particular student.

Training:

In training they will create the training.yml file using Haar Cascade Classifiers and face recognition is done by comparing the live images to training dataset. They will be recognized unknown faces of 50% accuracy level. Types of recognition are:

1. Eigen faces
2. Fisher faces
3. Local Binary Patterns Histograms (LBPH)

Training sets are differed from these types of Face Recognition. In FRAAMS we using LBPH algorithm.

For Face recognition. The process of FRAAMS in Figure [6].

Student Login
FRAAMS

Register Number
Register Number

Date of Birth
dd-mm-yyyy

LOGIN

[Admin Login ->](#)

Developed by Sanu P.L

Figure 2: Student Login

STUDENT DASHBOARD

Student Details

Details

Sno.	ID	Name	Register Number	Date of Birth	Department	Batch	Year	Gender	Email ID	Mobile No
1	1	PL Sanu			CSE		4	Male	plsanu.official@gmail.com	

Figure 3: Student Dashboard

In Figure [2] the students will login with their Register Number and Date of birth they will check their daily attendance. After login students will only view their details and search their attendance by monthly and yearly basis. Student dashboard and details will be shown in Figure [3]

Roles of Students:

- Login
- View Details
- Search Attendance
- View Attendance
- Logout

Admin Login
FRAAMS

Username
Username

Password
8 characters minimum

LOGIN

[Student Login ->](#)

Developed by Sanu P.L

Figure 4: Admin Login

ADMIN DASHBOARD

Manage Student

All Student Details

Sno.	ID	Name	Register Number	Date of Birth	Department	Batch	Year	Gender	Email ID	Mobile No
1	1	PL Sanu			CSE		4	Male	plsanu.official@gmail.com	

Figure 5: Admin Dashboard

In Figure [4] the admin will login with their username and password they will add, update, delete, and search students. They will export Attendance in three formats like PDF, CSV and EXCEL Format and admin will send SMS both FN & AN section and generate EMAIL to send Parents. Admin will send Attendance Record to their respective class Advisors with Monthly Basics. Admin dashboard and Students details will be shown in Figure [5].

Roles of Admin:

- Login
- Manage Student
- Export Attendance
- Search Student
- Send SMS
- Send Email
- Change Password

-
- ```

graph LR
 Input[Input Image] --> LBPH[Local Binary Patterns Histograms]
 LBPH --> Weibull[Weibull Distribution]
 Weibull --> ImageProcessing[Image Processing]
 ImageProcessing --> Database[Database]
 Database -- Haarfile.xml --> Training[Training]
 Training --> FaceDetection[Face Detection]
 FaceDetection --> FaceRecognition[Face Recognition]
 FaceRecognition --> Output[Output]

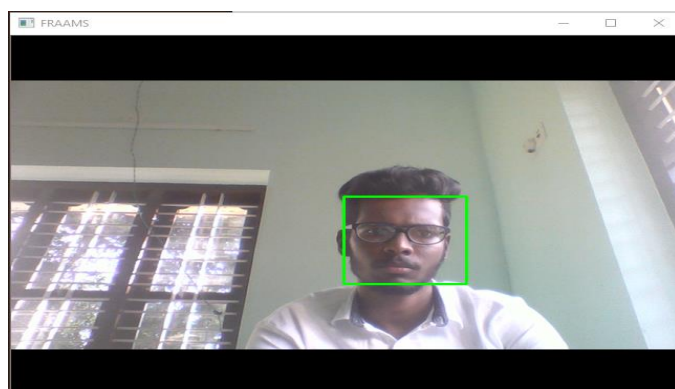
```
- The flowchart illustrates the architecture of the face recognition system. It begins with an input image, which is processed using Local Binary Patterns Histograms (LBPH). The resulting features are then passed through a Weibull distribution and image processing steps. The processed data is stored in a database. The database is used to train the system using Haarfile.xml. The trained model is then used for face detection and face recognition, leading to the final output.

## Figure 6: Process of FRAAMS



**Figure 7: FRAAMS SYSTEM**

In this FRAAMS System will be developed using Python Django Framework. The diagram of FRAAMS System will shows in Figure [7] They have three options Create dataset, training and detection.



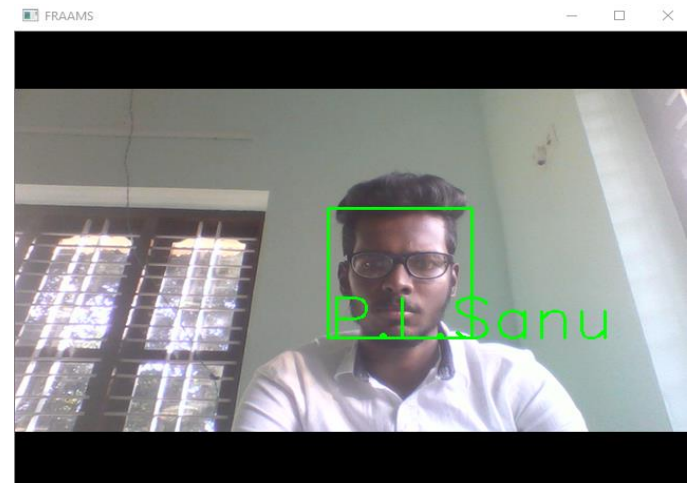
**Figure 8: FRAAMS DETECTED**

In this system Face detection is done by Haar cascade classifiers. Figure [8] will shows the detected image of face they represent with green color square format.



**Figure 9: Gray Scale Cropped Image**

In creating dataset, the student's image is cropped with the gray scale image conversion and they stored locally. Figure [9] will shows the gray scale cropped image.



**Figure 10: FRAAMS RECOGNIZED**



2 18-12 11:38 AM

P.L Sanu is **Present** Date Time:  
17/12/2019, 20:19:00



2 4:50 PM

P.L Sanu is Left from Campus Date  
Time: 26/12/2019, 16:35:43

**Figure 11: SMS ALERT**



Hide quoted text

| Name | REGISTER NUMBER | DEPARTMENT | YEAR | Email ID                   | ATTENDANCE_FN | ATTENDANCE_AN | RECORD_FN  | RECORD_AN  | MONTH     | AYEAR |
|------|-----------------|------------|------|----------------------------|---------------|---------------|------------|------------|-----------|-------|
| Sanu |                 | CSE        | 4    | pilsanu_official@gmail.com | Present       | Present       | 23/09/2019 | 31/09/2019 | September | 2019  |

**Figure 12: EMAIL ALERT**

After face detection process is completed then recognition is done by LBPH algorithm the recognized face is shown in Figure [10] In FRAAMS the Security features of SMS ALERT is shown in Figure [11] and the Email Alert is shown in Figure [12]

## V. CONCLUSION AND FUTURE WORK

In FRAAMS approach possess user friendly and it supports in all environment. In this system will work on Time Basics SMS and EMAIL Alerts for security purposes and it will improve the student's performance. In this project we are using Python Django Framework, Haar cascade classifiers and LBPH Algorithm for higher accuracy.

In Future Work this project will be done with Deep Learning using Tensor Flow and keras for more higher accuracy and improve more security features.

## REFERENCES

1. Faizan ahmad, 'Department of Computer science and Engineering', 'Beijing University of aeronautics & Astronautics', Beijing, 100000, china.
2. R.R.Karhe, 'Department of Electronics and Telicoomunications', 'Assistant Professor', International Journal of Research in Advent Technology, Vol.2, No.8, August 2014.
3. Kirtiraj Kadam, Manasi Jadhav, Shivam Mulay, Tushar Indalkar "Attendance Monitoring System Using Image Processing and Machine Learning". International Journal of Advance Engineering and Research Development Special Issue on Recent Trends in Data Engineering Volume 4, Special Issue 5, Dec.-2017.
4. Shashank Bhagekar, Saroj Jamdhade, Akash Gutti, Renuka Kamble, Prof. Amruta Vidwat "Face recognition using local binary pattern histogram (lbph) technique". Issn (print):2394-3408,(online):2394-3416,volume-5,issue-1,2018.
5. Opencv: [https://docs.opencv.org/2.4/modules/contrib/doc/facerec/facerec\\_tutorial.html#local-binary-patterns-histograms](https://docs.opencv.org/2.4/modules/contrib/doc/facerec/facerec_tutorial.html#local-binary-patterns-histograms)
6. LocalBinaryPatterns: [http://www.scholarpedia.org/article/Local\\_Binary\\_Patterns](http://www.scholarpedia.org/article/Local_Binary_Patterns)