A Study on Automated Attendance System using Facial Recognition

Ms. Munmun Bhagat[1], Chaitanya Kirkase[2], Yash Hawaldar[3], Aishwarya Paigude[4], Shivani Nimbalkar[5]

[1](Asst. Professor, Dept. of Computer Engineering RMD Sinhgad School of Engineering Pune, Maharashtra, India)
[2,3,4,5](Students, Dept. of Computer Engineering RMD Sinhgad School of Engineering Pune, Maharashtra, India)

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Abstract - *Attendance marking system has been become a challenging task in the real-time system. It is tough to mark the attendance of the candidate in the huge classroom/hall, and there are many students attend the class. Many attendance management systems have been implemented in the current research. However, the attendance management system by using facial recognition still has issues which allow the research to improve the current research to make the attendance management system working well. The paper has conducted a literature survey on the previous work by different researcher has done on their research paper.*

Keywords – Automated, Face Detection, Face Recognition, Algorithms, Correlation, Attendance.

1. INTRODUCTION

FACE Recognition has received many interests in recent years of face recognition development and has become a popular research. Moreover, it is a critical application in image analysis, and it is a very challenge to create an automated system based on face recognition; which has an ability to recognize human face accuracy. Solving the manual attendance problem and time-consuming, much research has been conducted with the automated or smart attendance management system to resolve the issues of manual attendance.

The key motivation is to go for this project was the slow down the inefficient traditional manual attendance system. This made us to think why not make it automated fast and mush efficient. Also some face detection and recognition techniques are in use by department like crime investigation where they use CCTV footages and face detection and recognition.

2. LITERATURE REVIEW

Sr No.	Author	Algorithm	Problem	Summary
1.	Visar Shehu [1]	PCA	The recognition rate is 56%, having a problem to recognize student in year 3 or 4	Using HAAR Classifier and computer vision algorithm to implement face recognition.
2.	Viola, M. J. Jones [8]	Viola and Jones algorithm	• In Viola and Jones the result depends on the data and weak classifiers. The quality of the final detection depends highly on the consistence of the training set. Both the size of the sets and the interclass variability are important factors to take in account. • The analysis shows very bad results when in case of multiple person with different sequence.	• The training of the data should be done in correct manner so that the quality final detection will increase. • System overview should contain the overall architecture that will give the clear and comprehensive information of the project.
3.	Kasar, M., Bhattacharyya, D. and Kim, T. [9]	Neural-Network	• Detection process is slow and computation is complex. • Overall performance is weaker than Viola-Jones algorithm.	Accurate only if large size of image was trained.

4.	Pratiksha M. Patel [10]	Contrast Limited Adaptive Histogram Equalization (CLAHE)	More sensitive to noise compared to histogram equalization.	Unlike, HE which works on entire image, it works on small data regions. Each tile's contrast is enhanced to ensure uniformly distributed histogram. Bilinear interpolation is then used to merge the neighboring tiles. • **Advantage:-** It prevent over enhancement as well as noise amplification.
5.	Suman Kumar Bhattacharyya & Kumar Rahul. [6]	Fisher face/ LDA (Linear Discriminant Analysis)	• Bigger database is required because images of different expression of the individual have to be trained in same class. • It depend more on database compared to PCA.	Images of individual with different illumination, facial expressions able to be recognized if more samples are trained.
6.	Varsha Gupta, Dipesh Sharma [7]	Successive mean quantization transform (SMQT) Features and sparse network of winnows (SNOW) Classifier Method.	The region contain very similar to grey value regions will be misidentified as face.	1. Capable to deal with lighting problem in object detection. 2. Efficient in computation
7.	Syen navaz [2]	PCA, ANN	• Low accuracy with the big size of images to train with PCA. • Hight Computational cost due to combining PCA and ANN	• Using PCA to train and reduce dimensionality and ANN to classify input data and find the pattern. • Using PCA and ANN to do a better attendance result.
8.	Md. Abdur Rahim et al [11]	LBP(Local Binary Pattern)	• Training time is longer than PCA and LDA.	• It is able to overcome variety of facial expressions, varying illumination, image rotation and aging of person. • Accuracy till 90.45%

3. PROPOSED SYSTEM

By considering the disadvantages of some systems mentioned in above table the attempt is made to implement the automated facial attendance system using SVM on LBP feature as LBP algorithm gives good accuracy as compare to other systems respectively.

The proposed system introduces an automated attendance system which integrates an Android app and face recognition algorithms. Any device with a camera can capture an image or a video and upload to the server using web app. The received file undergoes face detection and face recognition so the detected faces are extracted from the image.

➢ **Step by Step Description:-**

- **Step one:** User uploads a video / grabs images using camera on From Android mobile and send it to application server
- **Step Two:** Once we get the faces apply the preprocessing on images like noise removal, normalization etc.
- **Step Three:** Convert the image into Gray scale by taking the average of the each pixel RGB.
- **Step Four:** Apply SVM on Local Binary Patterns Histograms features.
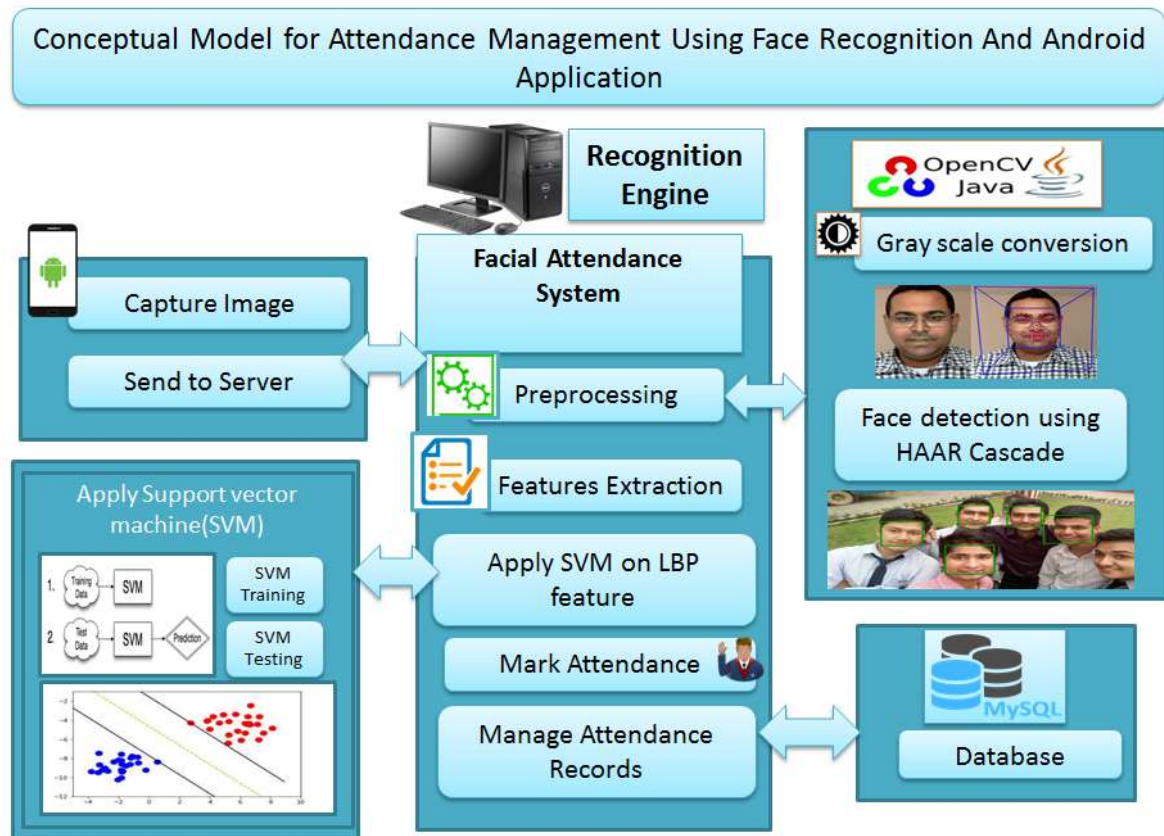- **Step Five:** Mark and Manage the Attendance.

Figure: - System Architecture

➢ **Competitive Advantages of Proposed System:-**

- Currently either manual or biometric attendance systems are being used in which manual is hectic and time consuming. The biometric serves one at a time, so there is a need of such system which could automatically mark the attendance of many persons at the same time.
- This proposed system is cost efficient, no extra hardware required just a daily mobile or tablet, etc. Hence it is easily deployable.
- Not only in institutes or organizations, it can also be used at any public places or entry-exit gates for advance surveillance.
- One of the big benefits of using facial attendance systems in any organization is that you won't have to worry about time fraud.

4. CONCLUSIONS

In order to maintain the attendance this system has been proposed. It replaces the manual system with an automated system which is fast, efficient, cost and time saving as replaces the stationary material and the paper work. However the proposed system is expected to give desired results. Also the efficiency could be improved by integrating other efficient techniques.

Here we discussed various method used by the researcher for face detection that can be used for educational or commercial organizations for monitoring student's attendance in a lecture by detecting the faces of the student. So in the next step, we are trying to build up a system with Improved Support Vector Machines (IVSM) on LBP features for the classification of the faces.

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