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AttendMe…. Real Time Marking System

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Abstract - *Education Institutes now a days are very much Concerned about student's performance. The main cause of decrease in students' performance is due to inadequate attendance, there are several ways of taking attendance, the most common ways are to call out student's name or providing them with an attendance sheet, both of these traditional methods of taking attendance are time consuming, inaccurate and problematic. To overcome these problems, we have proposed a new way of marking attendance what we call it as "Attend me". our new attendance marking system is quick, accurate, reliable and over comes all the drawback of the old traditional methods.*

Key Words: *Open CV, Face Recognition, Haarcascade, LBPH (Face Recognition).*

1.INTRODUCTION

In a classroom, marking attendance is one of the most hectic and time-consuming tasks for a lecturer, especially in a classroom where the strength is of 70+ students. All the hand written records of attendance are hard to maintain and analyze manually. Also, these methods are very much prone to false attendance or proxy. To overcome these drawbacks our proposed system uses some new technologies like face recognition to make the process faster and reliable. By using face recognition system, we can device a dynamic system. This system will mark attendance for student present in class automatically by recognizing their face. This system can recognize multiple faces at once and thus saving a lot of time.

1.1 AIM AND OBJECTIVE

1. Detection of unique face image amidst the other natural components such as walls, background etc.
2. Extraction of unique characteristics features of a face useful for face recognition.
3. Detection of faces amongst other face character such as bread, spectacles etc.
4. Effective recognition of unique faces in a crowd.
5. Automated update in the database without human intervention.

1.2 PROBLEM STATEMENT

In a class room of more than 70 students taking attendance Is not a simple task also if taken it has much higher possibility of errors and proxy.

Student's attendances are marked manually by calling names or providing attendance sheet to student, which is a time consuming and error prone event. Moreover, it is very difficult to verify each student in a large classroom environment with distributed branches whether the authenticated students are actually responding or not. As manual labor involved in this process is time consuming, an automated Attendance Management System (AMS) based on face detection and face recognition techniques is proposed in this paper.

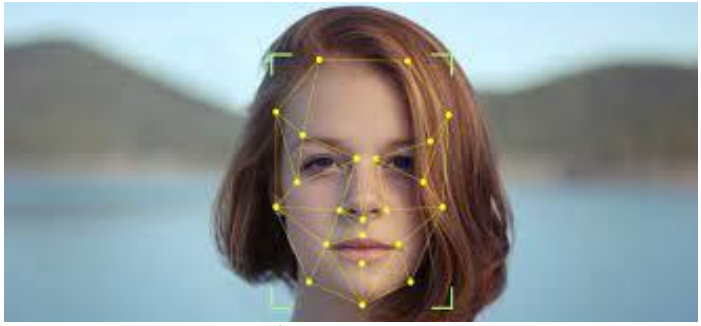

Fig 1 Face Mapping.

2. RELATED WORKS

Over the years some traditional attendance marking techniques were used by the lecturer but with upcoming digital era and number of growing literacy rate its not been convenient for the lecturer to mark attendance of such a huge strength of students to overcome this fingerprint scanning system were introduced which required the student to verify themselves which had full accuracy but that system too was slow and time consuming since every student has to separately authenticate themself with the increase in digital era we data handling is been simple and easy.

There is a huge increase in the literacy rate in different parts of the world since 2013. So, to cover most of the population in India we chose to build software application

Table 1 Strengths and Weaknesses of Existing System

Name of Method	Strengths	Weaknesses
Name Calling	1.Reliable 2.reduce risk of proxy	1.Time Consuming.
Fingerprint Scanning	1.Relible 2.No proxy	1.Time Consuming.
Attendance Sheet	1.Lower load on lecturer	1.Time Consuming. 2. higher risk of proxy

What Is LBPH Algorithm

Local binary patterns (**LBP**) is a type of visual descriptor used for classification in computer vision. LBP is the particular case of the Texture Spectrum model proposed in 1990. LBP was first described in 1994.[3][4] It has since been found to be a powerful feature for texture classification; it has further been determined that when LBP is combined with the Histogram of oriented gradients (HOG) descriptor, it improves the detection performance considerably on some datasets.

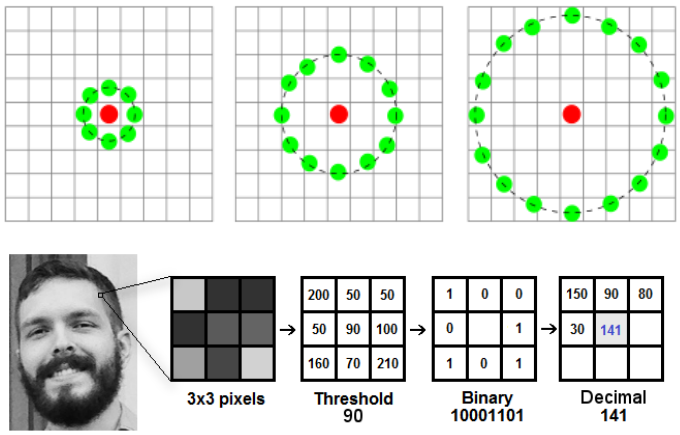

Fig 3 LBPH working.

Why LBPH Algorithm?

- LBPH is one of the easiest face recognition algorithms. It can represent local features in the images. It is possible to get great results (mainly in a controlled environment). It is robust against monotonic grey scale transformations.
- In computer science, face recognition is basically the task of recognizing a person based on its facial image. It has become very popular in the last two decades, mainly because of the new methods developed and the high quality of the current videos/cameras.
- The Face detection process describes the face of a person in input image. In feature extraction, facial landmarks are extracted and to make an LBPH histogram that gives the completely unique result and then in recognition process the histogram of the input image is compared with database histogram using the classifier.
- The LBPH is also provided by the OpenCV library. The OpenCV library can be used by many programming languages (e.g., C++, Python, Ruby, MATLAB).

3. METHODOLOGY

Face Detection: The algorithm for face recognition is used to find the characteristics which best describes and picture with face images that are already extracted cut, scaled down and usually converted into grayscale

Face Recognition is a biometric method for the identification of a person through a comparison of live or digital image data and the record stored for him. Face recognition involves:

- Face verification: Identify whose image it is among all the images
- Face identification

Verification or authentication of the image of the face:

Essentially it compares the face image inserted to the face image of the users requiring authentication. The comparison is basically 1X1

Face identification: Basically, it compares the input facial image to all the face images from a data set in order to find the user that matches that face. It is a 1XN comparison basically

LBPH algorithm for Face recognition "**Local binary pattern**" (**LBP**) is an easy yet effective

texture operator, where it identifies the pixels of images and consider the outcome to be a binary number through the threshold of its pixel's area.

The LBPH algorithm uses 4 parameters:

Radius: It is used to build the local circular binary prototypes and the central pixel radius is represented. It is normally is 1

Neighbors: The sample amount of the binary pattern circular to build. Please note that the higher cost of the computation good more sample points you include. Normally it is set to 8

X grid: horizontally oriented number of cells. The sooner the great the more cells, the greater the dimension of the resulting vector. Normally it is set to 8

Y grid: Here vertically oriented number of cells. The trainer to read, the more cells, the greater the dimensionality. Normally it is set to 8

Training the Algorithm: first, it is necessary to train the algorithm. Need to use a dataset of the facial photos of the people we want to know. We must also set an ID for each picture to identify the output of the image (this may be a number or the person's name). Photos must be identical from the same person.

4. EVALUATION

Testing's such as Unit testing, Integration testing, Load and Stress testing were performed on the prototype of our software. Some improvements regarding attendance data management in software and faster response rate were suggested by the testing team. These updates will be done in the next version of our software, and after Acceptance testing this software can be implemented in schools, colleges are working places.

5. FUTURE SCOPE

After the implementation of the system our team will be working on some new features for the Application. These features would be as follows: -

- An Attendance module where parents can get their child's monthly Attendance.
- A module that can automatically take attendance based on the specified time.
- Report of analysis of student's performance based on student's attendance using deep learning
- A module than can adapt to changes in facial characters like bread, mustache, spectacles.
- A Module for Mark sheet where parents can keepup with child's progress.

6. CONCLUSIONS

The Smart Face recognition-based attendance system can be implemented as an effective system in classrooms, laboratories, workplace and for security purposes. This method overcomes all the drawback proposed by the traditional attendance marking system and among all the other biometrics systems like fingerprint scanner etc. The face recognition-based system has the most excellent performance than its competitor biometric system. The probability of marking proxy attendance can be reduced by this method. To implement this system, we need a "raspberry pi 3 model", "raspberry pi camera", and a database. Also using Haarcascade and LBPH face recognition algorithm we can overcome the problem of different head orientation and low lighting conditions so to increase the accuracy and reliability.

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