1.Abstract

In this project we propose an automated attendance management system. This system, which is based on face detection and recognition algorithms, automatically detects the student when he enters the class room and marks the attendance by recognizing him. The system architecture and algorithms used in each stage are described in this project. Different real time scenarios are considered to evaluate the performance of various face recognition systems. This project also proposes the techniques to be used in order to handle the threats like spoofing. When compared to traditional attendance marking this system saves the time and also helps to monitor the students.

2. Introduction

Recognition technique is one of the most efficient biometric technique for identification of people. We can utilize it in the field of education for managing the attendance of students.
There are a lots of colleges and schools in which thousands of students are taking the education. In every classroom there are about ninety to hundred students are studying. Also in every few days, a new school or college is opened. To maintain the attendance and records of these so many numbers of students is a very difficult task.
In a classroom with large number of students, it is a very tedious and time consuming task to take the attendance manually. Therefore we can implement an effective system which will mark the attendance of students automatically by recognizing their faces.

The Local Binary Pattern Histogram(LBPH) algorithm is a simple solution on face recognition problem, which can recognize both front face and side face. However, the recognition rate of LBPH algorithm under the conditions of illumination diversification, expression variation and attitude deflection is decreased. To solve this problem, a modified LBPH algorithm based on pixel neighborhood gray median(MLBPH) is proposed. The gray value of the pixel is replaced by the median value of its neighborhood sampling value, and then the feature value is extracted by the sub blocks and the statistical histogram is established to form the MLBPH feature dictionary, which is used to recognize the human face identity compared with test image. Experiments are carried on FERET standard face database and the

creation of new face database, and the results show that MLBPH algorithm is superior to LBPH algorithm in recognition rate.

3. Literature Survey

3.1 Existing Work

At present attendance marking involves manual attendance on paper sheet by professors and teachers. but it is very time consuming process and chances of proxy is also one problem that arises in such type of attendance marking. also there are attendance marking system such as RFID, Biometrics etc. but these systems are currently not so much popular in schools and classrooms for students as they have their own advantages and disadvantages. 1.4 The Problems with Current System The problem with this approach in which manually taking and maintains the attendance records is that it is very inconvenient task. Traditionally, students attendances are taken manually by using attendance sheet given by the faculty members in class, which is a time consuming event Moreover, it is very difficult to verify one by one student in a large classroom environment with distributed branches whether the authenticated students are actually responding or not the ability to compute the attendance percentage becomes a major task as manual computation produces error and also wastes a lots of time this method could easily allows for impersonation and the attendance sheet could be stolen or lost.

3.2 Proposed Work

Traditional student attendance marking technique is often facing a lot of trouble. The face recognition student attendance system emphasis 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. Using Local Binary

Patterns Histograms (LBPH) algorithm in Open CV the student's faces are trained and recognized. Python automates the tasks by providing for the execution of the programs in Computer Vision and GUI of the system along with managing the database of the student 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.

3.3 Advantages of proposed work

1.Removes the risk of Manual Errors: Facial recognition software gives users a means of tracing their student's attendance, by further removing human mistakes.

2.Automated plus Accurate: Face recognition precisely reports all the features of attendance, absenteeism, and also over time. The identification procedure is spot-on every single time at a speed that is now practically possible. This scheme can match thousands of operators in less than a second, plus the software offers info that is 100% precise without you lifting a finger.

3.Saves Time: Facial recognition permits employees to waltz in and out inside seconds, instantly removing the inconvenience of swiping cards otherwise singling badges around. This saves time and effort, resulting in a satisfactory working environment.

4. Fast and accurate identification: Student should only look at the device for less than a second he will be identified.

5. Touch-Free: Unlike the fingerprint hardware that employee should use his finger, the face terminals doesn't require body punch,

6.Hygienic: Facial recognition technology does not require any physical engagement.

7.Proxy attendance is eliminated: Attendance is taken automatically by the camera placed in the classroom therefore there will be no chances of proxy attendances.

8.Simple Algorithm & Flowcharts: This system uses a simple algorithm and flowchart which is easy to understand as there are no complicated sections, information flow is simple as there is less hardware's components used therefore each section is clearly Understood.

9.Virtual Classroom: Virtual classrooms are the class rooms without the lecturers to teach as students will be learning online. This system is very useful in virtual classrooms where there will be no lecturers to take attendances this system will automatically manage the attendances of the students.

4.Outline of Proposed Work

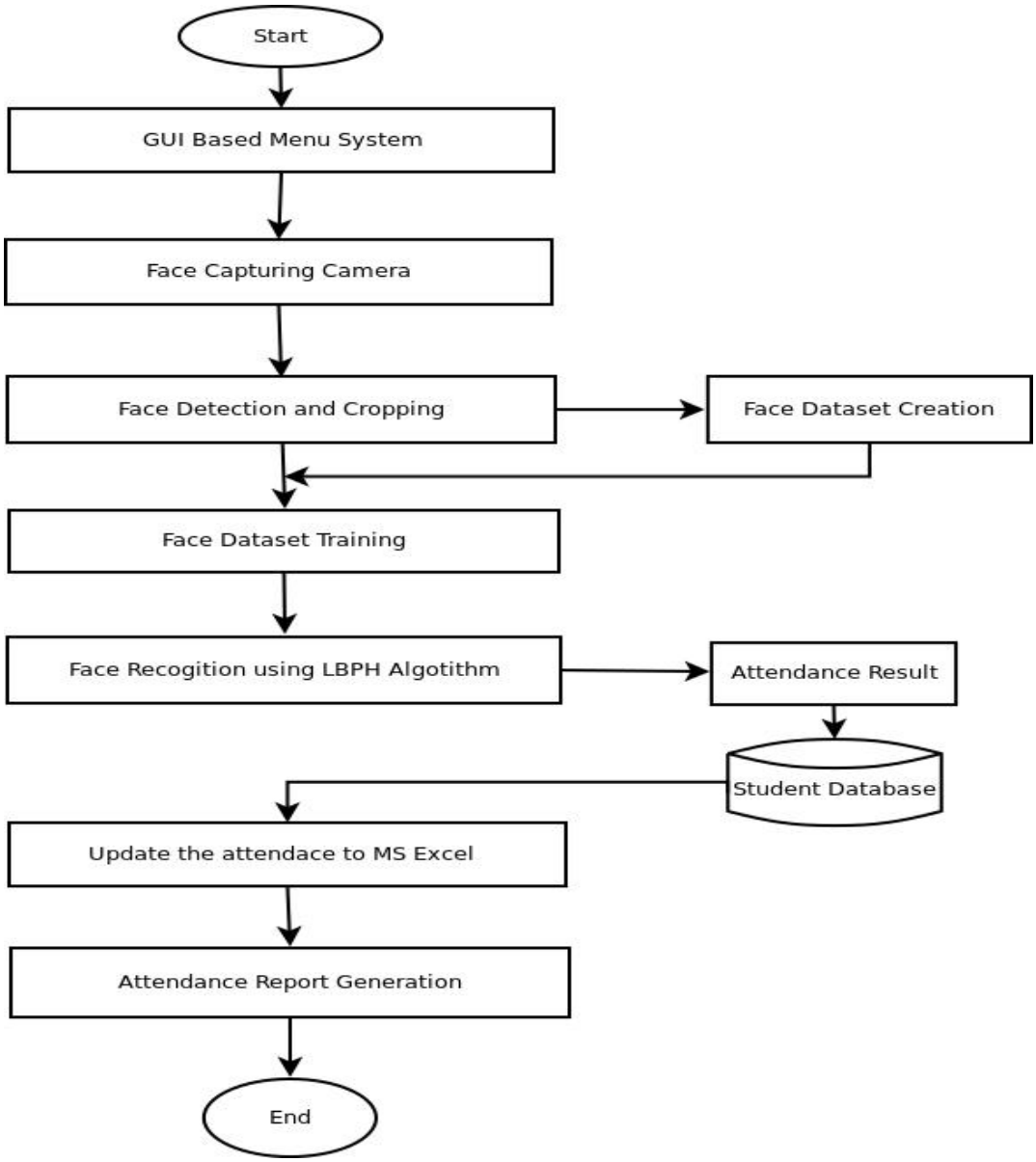

Fig: *Facial Recognition based Attendance System Flowchart*

5. List of modules with description

Module 1: GUI Based Menu System

In this module a GUI based menu system is shown for assisting the user with various functions available and using them.

Module 2: Creating Face Dataset

In this module, the webcam captures the images of the student/user in order to create a dataset of 30 images of various positions of their face.

Module 3 : Train the Image Dataset

In this module, the dataset is trained using machine learning algorithm and a training data file is created.

Module 4: Facial Recognition and Attendance

In this module, the webcam captures the image of the student/user and identifies the person and sets the attendance as present/absent and the default created database is updated with the information.

Module 5: Attendance Sheet

In this module the information in the updated database is imported and then converted to a Spreadsheet content such as MS Excel file and generation of the attendance report for that day with date and time takes place.

6. Requirements:

6.1 Hardware Requirements:

- Personal Computer with Standard Configuration
- Web cam

6.2 Software Requirements:

- Sublime text 3
- My SQL
- Python 2.7/3
- Open CV3

7. References

Books:

OpenCV with Python By Example

Machine Learning for Open CV

Websites:

https://opencv.org/

http://pyimagesearch.com/

https://medium.com/data-science-101/face-recognition-opencv-e841dc0006c6

https://towardsdatascience.com/face-recognition-how-lbph-works-90ec258c3d6b