An Advanced Attendance Marking system using facial Recognition

Jarugula.Vamsikrishna¹
Final Year UG student-Dept of ECE,
Sathyabama Institute of Science and Technology,
Chennai – India.
vamsikrishna0777@gmail.com

Kollipara.Anudeep¹
Final Year UG student-Dept of ECE,
Sathyabama Institute of Science and Technology,
Chennai – India.
kolliparaanudeep1234@gmail.com

L.Jegan Antony Marcilin²
Assistant Professor, Department of ECE
Sathyabama Institute of Science and Technology,
Chennai – India.
jegan25@hotmail.com

V. Balamurugan³
Assistant Professor, Department of ECE
Sathyabama Institute of Science and Technology,
Chennai – India.
vbbala@gmail.com

Abstract. With advancement in computing and telecommunications technologies, digital images and videos are playing main role in the current information era. Human face is an important bio-metric object in image and video database of surveillance systems. Detecting and location of human faces and facial features in an image sequence is an important task in dynamic environments, such as videos where noise conditions, illuminations, locations of subjects and pose can vary significantly from frame to frame. An automated attendance system is used for marking human face recognition in real time for college to mark the attendance for their staff and students. Smart automated attendance marking using real time face recognition is a real world solution which comes with day to day activities of handling employees. Here multiple user faces are detected and recognized with the data base trained multiple texture based notability.

1. Introduction

The attendance maintaining system is difficult process if it is done manually. The smart and automated attendance system for managing the attendance can be implemented using the various ways of biometrics. Face recognition is one of them. By using this system, the issue of fake attendance and proxies can be solved. In the previous face recognition based attendance system, there were some disadvantages like intensity of light problem and head pose problem. In this project, Dominant Rotated Local Binary Pattern is used.

The major steps in this system are detecting the faces and recognizing them. After this, the comparison of detected faces will crosscheck with the database faces. This smart system will be an effective way to maintain the attendance and records of students. The attendance details will be sent through E-mail.
person is entering the class it will cross check with the database and if their record is present in the database then their name will be send through e-mail. If a person is leaving the room their photo along with their name will be sent to the concern people.

2. Pattern

In this paper the pattern used is dominant rotated local binary pattern (DRLBP). By using “vision.Cascade Object Detector” keyword only the face of the person is recognized. This recognition can be designed as required by the programmer like shape and color of the recognition box.

The recognized face will be converted into pixels. A 3*3 matrix formed from the pixels will be considered and the middle most (5th) element will be taken for reference. The other elements of the matrix will be compared with reference. If the value is greater than the reference value, it will be assigned to Zero. If the value is less than the reference value, it will be assigned to One. Now the newly obtained matrix will comprise of only binary values (0 &1) and it is compared with the database faces.

![LBP Code image](image.png)

Fig.1 LBP Code image

3. Description

The system contains two modules mainly

1) Data base creation.
2) Attendance Marking Through Face recognition

3.1 Database Creation

In this module, the system is designed to store the faces and their facial features of the persons. The Flow Diagram of the database creation is described below in detail.
3.1.1 Single person Face Image

The Images of the persons will be taken individually using digital cameras and will be stored in the server/data storage devices. The data of persons will be stored in a specified folder and their names also will be stored in the folder in order to mark attendance. If the server is having more images of a particular person then we can get accurate results.

3.1.2 Face Area Detection

Image is processed to extract face regions from input image which has normalized intensity. Here MATLAB vision tool box will be utilized to detect the face from the input and it uses DRLBP algorithm. In the MATLAB vision tool box the face boundary vector [Xmin, Ymin, Width and height] are cropped to get the desired region for further analysis.
3.1.3 Features Extraction and Training

It will be useful when image sizes are large and a reduced feature representation is required to quickly complete tasks such as image matching and retrieval. Facial land features like nose, eyes and lips will be helpful for the person recognition.

3.1.4 Data base creation

The images taken from the digital cameras will be stored in a folder and will be assigned a name to the particular person and this process should be continued until all the persons data is stored.

3.2 Attendance Marking through Face recognition

In this Module, Real Time Face will be detected and pre-processed, compared with database and attendance will be marked and sent through E-mail and records will be maintained in the email server which will be helpful for the marking of attendance.
3.2.1 Image with person & Multi face Detection

When a person is entering/leaving Real time frames will be taken and it will check each and every frame taken and faces are detected by using vision tool in MATLAB. If two or more persons are encountered in a particular frame, then Each and every person faces also will be detected.

3.2.2 Cropping and Face Rejection

The person image is cropped by using vision tool and it will be cross check with the database. If the person face in that particular frame is not clear/distorted then it will be automatically rejected otherwise it will go to further process.

3.2.3 Classification of Faces

When a person is entering/leaving, the person is detected in real time then the features will be extracted from the detected face and it will cross check with the data stored in the database if it is matched then it will mark the attendance either present or absent through E-mail.
4. Result

Attendance will be automatically marked and it will send to E-mail shown in the above Fig. Day to Day Student Attendance Database can be maintained and it is secured.

References

[1] Dr.Ramaprasad.P, Rekha.E , ”An Efficient Automated Attendance Management System Based On Eigen Face Recognition”, 7th International Conference on Cloud Computing, Data sciences and Engineering-Conference,2017.

[2] Jiachen Chen, W.Kenneth Jenkins, “Facial Recognition with Principal Component Analysis and Machine Learning Methods”, International Journal of Scientific Research in Computer Science and Engineering,2017.

[3] Ahmed Aldhahab, Wasfy B.Mikhael, “A facial recognition method based on DMW Transformed Partitioned Images.” 2017.

[4] Jin Liu,Yue Chen “Face Recognition Based on Multi-Direction Local Binary Pattern” 3rd IEEE International Conference on Computer and communications-2017.

[5] Khem Puthea,Rudy Hartantoand Risnuri Hidayat,” A Review Paper on Attendance Marking System Based on Face Recognition”, 2nd International Conference on Information Technology,Information Systems and Electrical Engineering-2017.

[6] C.B.Yuvaraj,M.Srikanth,V.Santoshkumar,Y.V.SrinivasaMurthy and Shashidhar G.Koolagudi,”An Approach to Maintain Attendance Using Image Processing Techniques”,10th International Conference on Contemporary Computing -2017.

[7] Refik Samet,Mohammed Tanriverdi, ”Face Recognition-Based Mobile Automatic Classroom Attendance Management System”, International conference on Cyberworlds -2017.

[8] Visar Shehu, Agni Dika, “Using Real Time Computer Vision Algorithms in Automatic Jiachen Attendance System,” International Conference on Information Technology Interfaces June 2010.

[9] Robert C.Schultz , Robert W.Ives , “Biometric Data Acquisition using MATLAB GUIs,” 35th ASEE/IEEE Frontiers in Education Conference.2005.

[10] LI-Ying Lang, Wei-Wei Gu, “A Robustness and real time face detection algorithm in complex background.” 2009.