A Conceptual Model for Automated Attendance Marking System using Facial Recognition

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ABSTRACT: *The project represents an automated attendance system based on face recognition using discriminative local binary pattern and local directional pattern descriptors. The proposed system involves face detection, Features extraction and matching. The face detection is to detect faces based on Viola Jones algorithm . In feature extraction stage, the discriminative local binary pattern is used for different object texture feature extraction process. The proposed method with new features retain the contrast information of image patterns. The Facial recognition (or face recognition) is a type of biometric application that can identify a specific individual in a digital image by analyzing and comparing patterns based on the data stored in database. Smart attendance is a real time face recognition used for handling day to day activities of the employees and students. In manual attendance system there are several issues like fake attendance and mistakenly marked absent by carelessness of the faculty/teachers/lectures. In order to overcome these problems we are using this smart attendance system. Here multiple faces are detected and recognized with trained with various features. The automated face attendance marking system gives accurate performance.*
Keywords --Facial Recognition System, Automated Student Attendance System, Raspberry pi, Webcam.

I. INTRODUCTION

1.1 overview

The manual attendance system has its own difficulty for maintaining the accuracy. We can consider to mark attendance with its new automated marking and managing it in a smarter way using various techniques with the help of biometrics. In such a way, face recognition is ideal way for this proposal. It paves a way to overcome proxies and fake attendance in a smarter way. A Survey on earlier methods have problems in light direction and pose the head properly. The proposed method has techniques like local binary pattern and algorithm like Viola and Jones are applied.

The important tasks in this are to detect the faces and recognize them. Recognizing will be done based on the comparison of detected faces with checking the similarities with the faces features. It is easy to extract distinct features from individual's face. The facial recognition systems identifies coordinate value of a human face using linear binary pattern algorithm.

These algorithm are used to identifies the coordinate values of a human's face, such as the nose's length and width, the eyes depth and cheekbones shape of human's face. The proposed will be worked based on the data captured by digital camera's image of individual face and store the resultant of captured data as a face print in the database. In day to day activities are in increase led to handling of it through electronically based rather by manual control by face to face or draw the image using pen and pencil. The wide growth in electronic transactions, there is a great demand for accurate user identification and authentication. Face recognition technology can also solve the problem in case of identical twins when the face is undeniably. An automated attendance marking system requires no physical interaction

II. OBJECTIVE

The objective is to provide efficient and effective method for marking attendance thereby reducing the human maintaining and controlling by using Viola and Jones algorithm, local binary pattern extraction and scale invariant feature transformation.

III. ALGORITHM

1. *Local binary pattern extraction* **:**
   a. The windows are divided into cells (e.g. 16x16 pixels for each cell)
   b. For each pixel in a cell, compare the pixel to each of its 8 other values (this may be left-top, left-middle, left-bottom, right-top, etc.).
   c. Along a circle follow the pixels, i.e. clockwise or counter-clockwise.
   d. The value is assigned 0, if the center of the pixel value is the greater than the other. If not, assign the value to 1.

2. *Viola-Jones Algorithm:*

   a. In Viola-Jones algorithm to detect people's faces, we use cascade object detector
   b. The **Image Labeler** is used to train a custom

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classifier and System object for classifier's usage.
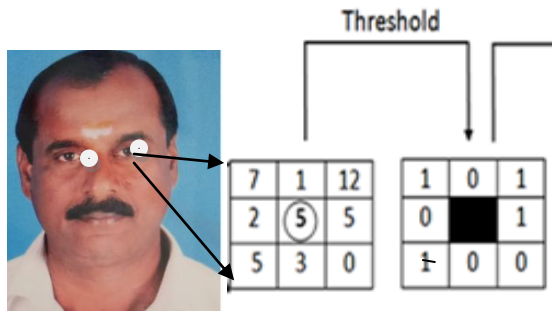
3. Scale invariant feature transform(SIFT):

The detection and description of local features in images of human's face.

IV.EXISTING SYSTEM

A face recognition is one of the application of computer vision and image processing which is capable of performing two tasks of identifying and verifying a person from its facial features and image or a video from the database. The objective is to automate the attendance system with the help of integrating the face recognition technology. In conventional attendance, a lot of time conception, manipulation of attendance, information cannot be secured .

V. PROPOSED SYSTEM

The proposal is to give the efficient attendance marking system by camera recording the image. From the camera, the image of the student is obtained by the usage of viola jones algorithm which is used for face detection and recognition. The detected improved face is compared to the data base. Because of using two camera the entering and leaving of the student can be obtained easily which gives the accurate attendance for each period.And the result is send to the correspondent higher official through e-mail. So ,these methods make the process simple and give the accurate result.
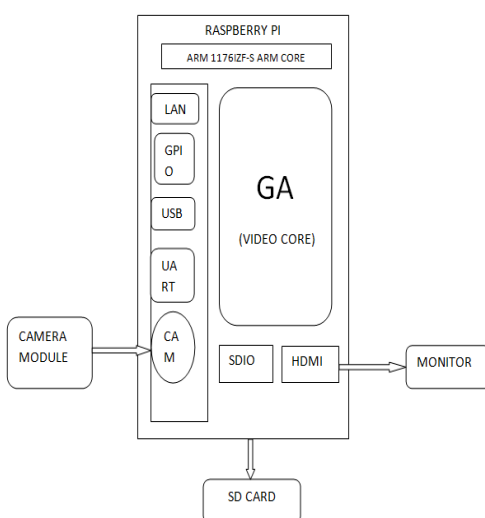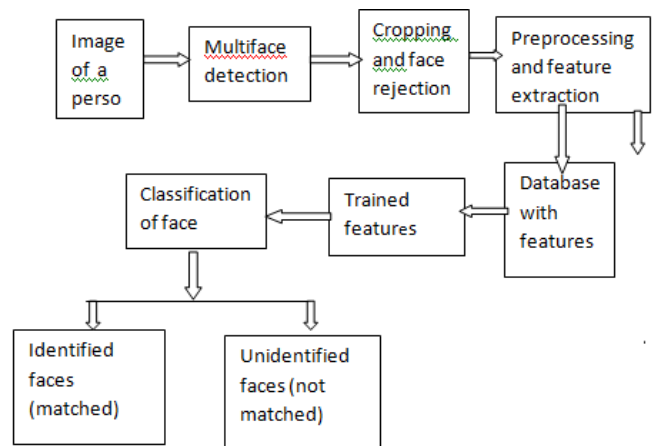
VI.WORKING PRINCIPLE

Fig 1.Block Diagram

VII.MODULE DESCRIPTION

Fig2.module

The system architecture description as follows:

a. Multiface detection
b. Cropping and face rejection
c. Preprocessing
d. Database Generation

Multiface detection :

Multiple faces are detected and recognized from the database with has multiple texture based features trained for its use.

Cropping and face rejection :

It Will capture the face and it will crop the face part alone for checking the coordinate value. Cropping the image with respect to coordinate values.

preprocessing:

a. RGB to gray conversion.
b. Filtering of images.
c. Resizing of images into same row and same column.

Database generation:

Original face database consists of images with 15 different persons with 10images per person.size of each images is 48*64 pixels.sample images of some of the persons from our face database.with change in intensity of light and various facial expressions with original database image.
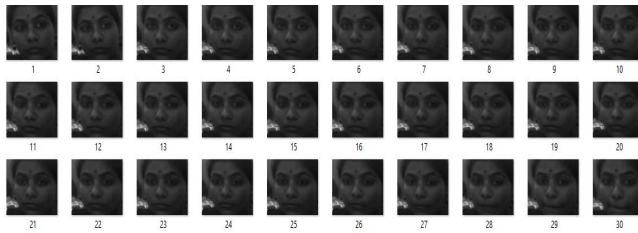

fig.3 database creation

Automated attendance marking :

Once the face verification and its recognition done successfully, the attendance will be automatically marked for each person based on the comparison result. An automated attendance marking system involves no physical interaction.

Matched/non matched faces:

The faces are classified through the neural networks .hence,the matched faces shows the present/absent that is indicated by respective names via non-matched faces by scanning that will not indicate any name.because,all the images are sored in corresponding database.
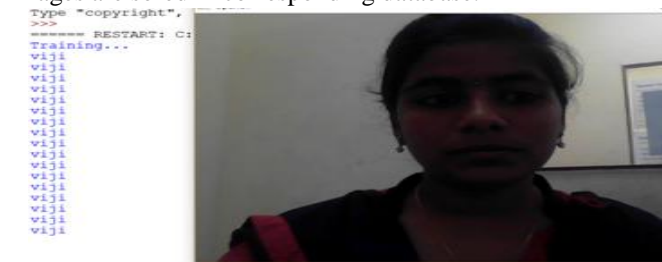

fig 4.face recognition

The advantages of the proposed are:

- Increase in accuracy
- Security and safety
- More reliable

In various application, this can be applied into:

a. High efficient signal transfer system: College, office and company etc.
b. Security/Counterterrorism: Accessing the control, comparison of surveillance images to know/detect the terrorist.
c. Day Care: Verification of individuals those who pick up the children.
d. Residential Security: Alerting homeowners of approaching personnel based on indifferent behavior.

[1] Soumak Biswas "A New Method for Face Recognition using Feature Clustering with Fuzzy Parameters(2015)",

The transformation of points into crisp numbers. The number of facial points are then reduced by using a distance formula. The distance of each of these facial points are then stored in the database of the system. The same methodology is applied on the input face which is to be matched with the faces available in the database. Then a fuzzy preference relation matrix is obtained. In the broadest sense we have observed we have used the fuzzy mathematics to counter the impreciseness in facial recognition. The disadvantage is less features for detection.

VIII. RESULTS AND DISCUSSION

What are all the images are given or stored in the database, that image gets displayed in the python screen. whereas unknown persons image will not be noted as present or absent. face database is loaded to workspace in Python. Image is captured which is subjected to various preprocessing techniques. Later, the attendance is taken and sends through the mail.
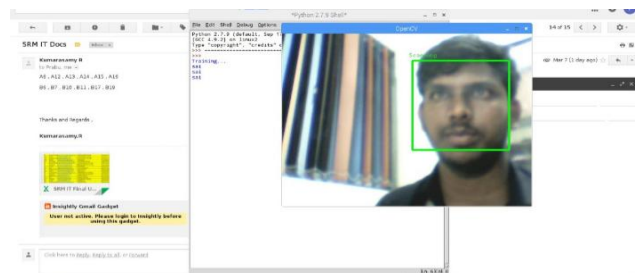

Fig4.output

IX.CONCLUSION

Face Recognition is one of the real world solution for many application which tracks or in use for day to day activities for handling students/employees. The multiple user face are to be detected and recognised with the database which had been trained for multiple texture based features. Automated Attendance Systems based on face recognition provide the advantages of saving the time as well as secure authentication is provided. The proposed system helps to identify an unknown person. The future work is to improve the accuracy rate of detection and recognition of unintentional changes in a person.

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