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Automatic Attendance Base Web Server College Website

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Abstract: Authentication will perform a vital role in the computer based communication. The usual approach for the attendance is the professor calls the student name and records the attendance. This leads to the wastage of time for the parents to check the regular presence of the students to the college and also college administrative people. To avoid this we are going to use the automatic system which is based on face recognition technique. This project informing the parent about the presence of the student for the college through GSM SMS will give the automatic solution. In this GSM based automatic attendance system we are going to use the webcam, zigbee, GSM. The working of this project is identifying the face and marks the attendance for the corresponding person as in the database.

Keywords: GSM MODEL, WEBCAM, FACE RECOGNITION, FACE DATABASE

I. INTRODUCTION

Presently, attendance of students in most institutes is taken by the teacher on paper based attendance registers. There are various disadvantages to this approach such as data is not available for analysis because paper based registers are not uploaded to a centralised system, time taken for data collection reduces the effective lecture time and fake attendance by students. The existing conventional attendance system requires students to manually sign the attendance sheet every time they attend a class. As common as it seems, such a system lacks automation, where a number of problems may arise. This includes the time unnecessarily consumed by the students to find and sign their name on the attendance sheet; some students may mistakenly or purposely sign another student's name. Also, the attendance sheet may get misplaced. As for system development and implementation, it should be able to help the lecturers to manage their student attendance systematically. By considering this issue we propose an attendance tracking system based on Face recognition based on GSM based technology. The system throughout the academic faculty will benefit the academic management as students attendance to classes is one of the key factors in improving the quality of teaching and monitoring their students' performance. A. Face recognition process:

The facial recognition process can be divided into two main steps: processing before detection where face detection and alignment take place (localization and normalisation), and afterwards recognition occurs through feature extraction and matching steps. The face recognition processing flow diagram is shown in fig. 1. The objective of our project is to implement a still image based face recognition algorithm using webcam. The resources include web camera, GSM based, personal computer, LCD, Zigbee.

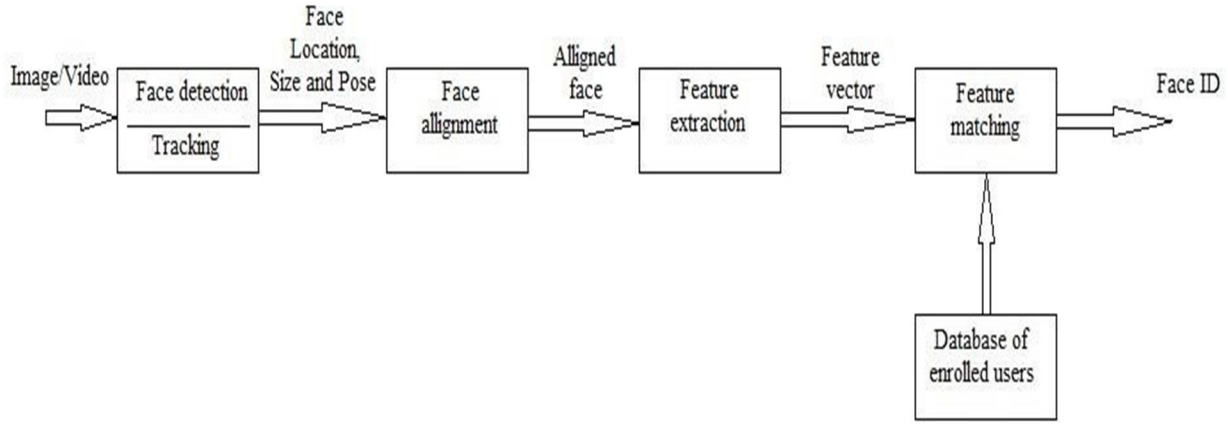

Fig.1: Face Recognition Processing Flow

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II. LITERATURE SURVEY

Mr. C.S.Patil et al[1] proposed a student recording system using face authentication was designed and implemented. It was tested with different face images. This idea is working properly with different panels. All windows are running independently and parallel. From this paper we have taken the concept of a webcam. Pallavi Vema and Namit Gupta et al[2] proposed the main purpose of this project is to monitor the student attendance in lecture, tutorial and laboratory sessions in a more efficient way and send this attendance to their parents. This system resists students from bunking classes through SMS sending features to parents. From this paper we have adopted the concept of GSM through which SMS is sent to their parents.Sneha Suhas More et al [3]The system is primarily used for monitoring a particular area and automatically marking the attendance, it reduces the drawbacks of traditional attendance system which is proxy attendance, wastage of class hours etc., it will successfully mark the attendance of individual student and overall class benefit to know and report a mass bunk in case of low overall attendance. The updated attendance can be viewed by the authorities without any dependencies. By this paper we have included the concept of storing student information in a college database.

III. PROPOSED METHOD

A. Operation Of Recording System Using Face Recognition

This is the diagram of student attendance using face recognition with GSM based. The PIC controller interfaces with GSM board, APR board, Zigbee and LCD. Face of the particular student is captured by web-cam and stored into the database by using MATLAB code in the form of pixels. LCD is used for indicating delivery reports about message sending to the number which is stored in the controller. Different AT Commands are used for different purposes. The transmitter and receiver block diagram for generating attendance is as shown below fig. 2. It consists of a power supply, webcam, LCD, PIC controller, GSM, APR board and Zigbee. These blocks are connected to each other using serial data bus.Fig. 2 shown is for input image processing. Overview of capturing images from outside world and Save in database. If the image is not captured properly then it will give an error otherwise it displays an output message of a matching face. The captured image is sent to the PIC controller where it matches the obtained image with the initial image that is stored in the college database, if the image and ID number is matched the student is marked as present. ID number is used for security purposes.

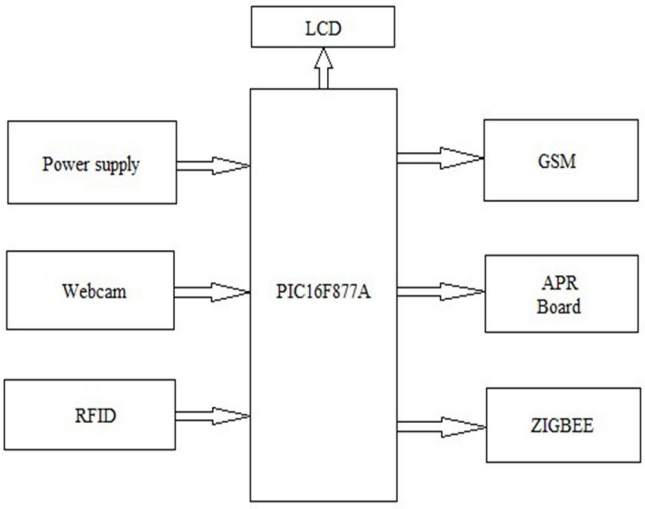

Fig. 2(a): Transmitter block diagram for generating attendance

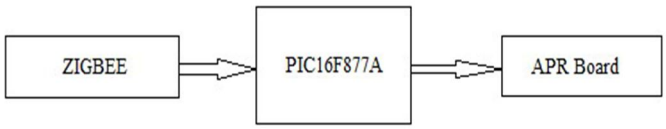

Fig. 2(b): Receiver block diagram for generating attendance

PIC microcontrollers (Programmable Interface Controllers) are electronic circuits that can be programmed to carry out a vast range of tasks. When the program has been simulated and works, it is downloaded to the PIC microcontroller circuit. If the student is not present in the class then this information is passed to their parents' mobile number throughGSM.GSM is a cellular network, which means that mobile phones connect to it by searching for cells in the immediate vicinity. GSM networks operate in four different frequency ranges. MostGSM networks operate at 900MHz. GSM-900 uses 890-915MHz to send information from the mobile station to the base station (uplink) and 935–960 MHz for the other direction (downlink).This 25MHz band width is subdivided into 124 carrier frequency channels, each spaced 200 KHz apart. The channel data rate is 270.833Kbit/s.

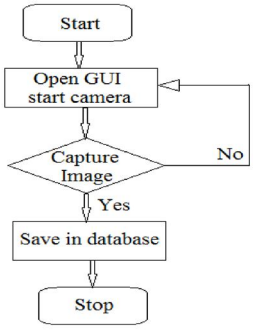

Fig. 3: Input Image Flowchart

The next component used is the APR (Audio Playback Recorder) board which is used in classrooms and as well as in staff rooms. The main aim for including this is to give information about the next hour class/period i.e., it tells about the subject and corresponding teaching staff, the same is repeated at the staff rooms also. It gives information 15 minutes early so that the corresponding teacher can prepare themselves for the next class. ZigBee is a technology of data transfer in wireless network. ZigBee is a low-cost, low-power, wireless mesh network standard targeted at the wide development of long battery life devices in wireless control and monitoring applications. Zigbee network must consist of at least one coordinator which acts as a root and bridge of the network. The coordinator is responsible for handling and storing the information while performing receiving and transmitting data operations. A passive RFIDtag without a battery. When radio waves from the reader reach the chip's antenna, it creates a magnetic field. The tag draws power from the field and is able to send back information stored on the chip. Passive tag collects hundreds of tags within 3 metres from a single reader and then it collects 20 tags moving at 3 mph or slower. It is used to differentiate between twin faces.

B. Attendance Database

The camera in our system is set up such that it captures only frontal images so the problem of pose is not an issue. During the detection phase the image is converted into grayscale. The same technique is applied to faces in the student image database.

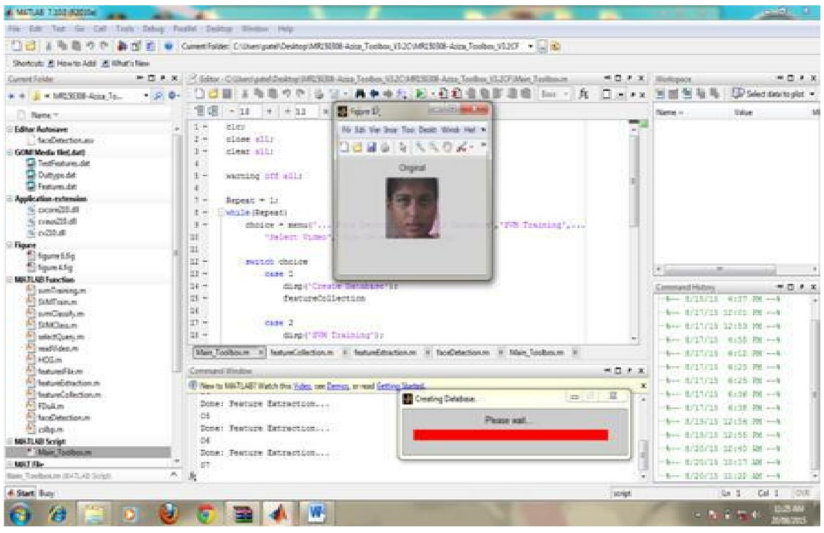

Fig.4: Shows The Database Creation students

Background subtraction on our images is also done so that other objects do not interfere during the process. Another issue is that faces are subject to change during time (facial hair, different hairstyles etc.). Whenever a face is successfully identified and a copy of that face is stored in the database of faces which is a training set for that student. Together with the image we store the time and date when this image was taken. This way it identifies gradual appearance changes of the students. On each scan for a student, the recognition operation performs comparison of images stored in the database, sorted in descending order by date. This approach was used since the latest image of a student on our database is most likely to be more similar to the current captured image. Of course, a sudden drastic change on a student's look cannot be identified for that particular instance.To solve this issue, we have included a module, which lists all unidentified faces and the teacher is able to manually connect a captured face with a student from the list. This image is stored as an updated picture of a particular student. The recognition process is performed only once. In a subsequent scan, this student is identified automatically by the system. To speed up the face recognition process we only compare images captured in a classroom, with the database of students stored for that particular subject. This ensures that we process only a small subset of images available on our central data base.Fig. 4 shows the database creation of students.

IV. CONCLUSIONS AND FUTURE WORK

Face detection and recognition has been a challenging task due to unconstrained conditions. Webcam detects the student face and captures the facial expression and sends it to the PIC microcontroller. Using MATLAB code PIC controller compares the captured image with the initial stored image in the database, if it matches it is marked as present. If the student is absent his/her details are sent to their parents through GSM. APR board is used to get the information about the next class and the corresponding teacher.

Our proposed project, ―An Automatic Attendance System using webcam and RFID has been envisioned for the purpose of reducing the errors that occur in the traditional (manual) attendance taking system. The aim is to automate and make a system that is useful to the organisation such as an institute. The camera plays a crucial role in the working of the system hence the image quality and performance of the camera in real time scenarios must be tested thoroughly before actual implementation. Students' attendance status will be updated to their parents through SMS and also gives the period notification to staffs. RFID is used for security purpose. This method is secure enough, reliable and available for use. No need for specialised hardware for installing the system in the classroom. It can be constructed using a camera and computer

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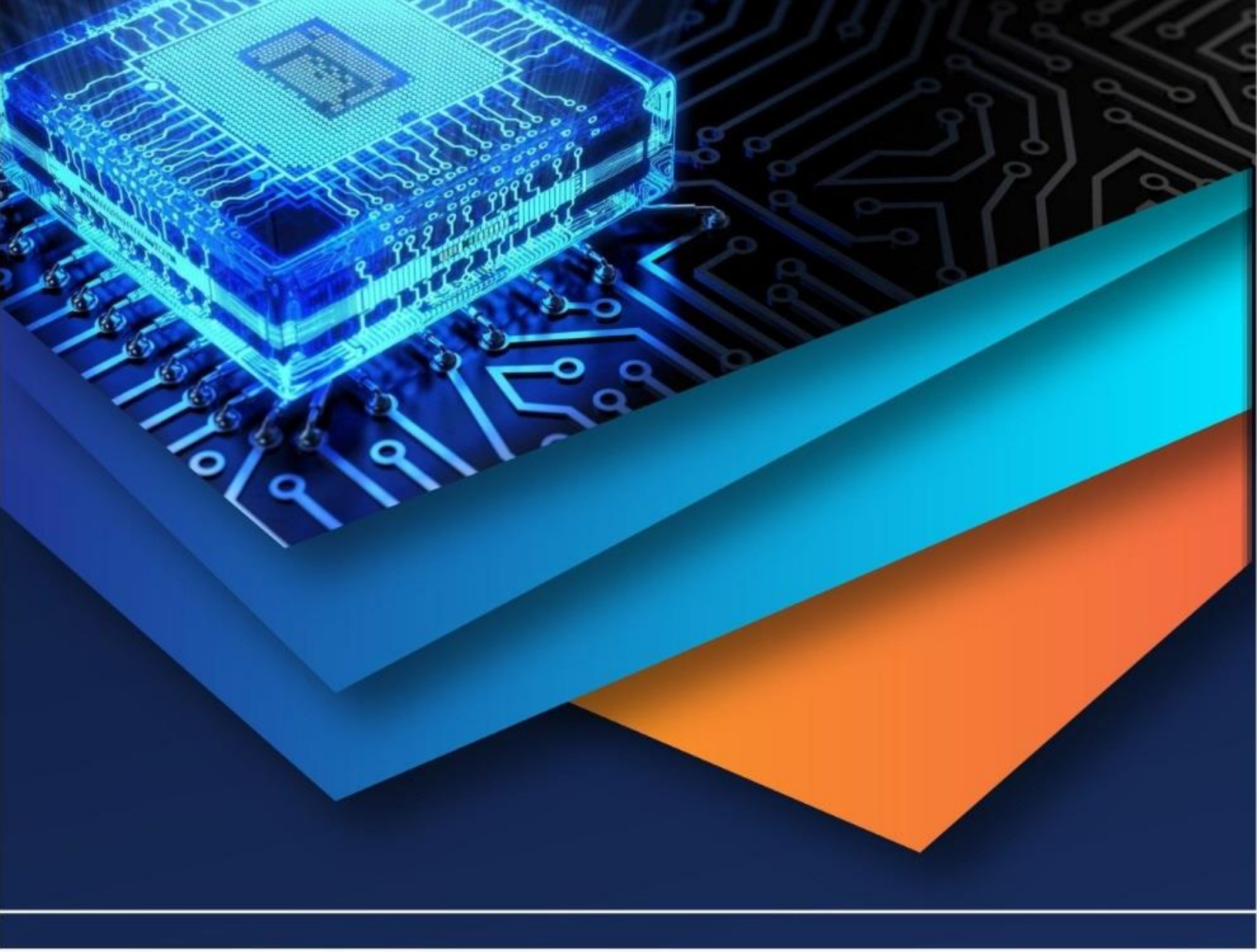

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