Wireless Smart Biometric Attendance System

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Abstract: The most generally utilized techniques for taking participation in the classroom is by calling the learners to physically sign the participation sheet which is ordinarily passed around the study room while the educator is driving the lecture. In past, the records are taken physically and maintained the student's records. It was an inconvenient job for the teachers. To overcome these issues, we develop a smart biometric attendance system which takes participation of understudy and keeping up its presence in a scholastic establishment. With the assistance of a unique mark sensor module and every student presence are saved on a PC. Through wireless transfer system reports are saved on the computer system.

Key Words: Arduino UNO, Fingerprint sensor, Zigbee and GSM Modules

I. INTRODUCTION

Attendance system exists in different places like institutions, organizations, hospitals, and so on, both morning and evening. In early days, the attendances are recorded physically by calling out the names of the candidate. It consumed more time and more man power. Likewise, there are numerous deceitful issues that happen when we use an attendance sheet [1].For instance, the lecturers' reads the students name one after the other and record their presence of the graduates and playsvital role for a reliable attendance system. To make the participation framework increasingly secure and reliable for affirmation, biometrics information is clubbed. The data privacy using FPGA are discussed in [9].Amid enrolment, the finger impression of the client is caught and its extraordinary highlights removed and put away in a database alongside the clients way of life as a format for the subject. The remarkable highlights called details focuses were separated utilizing the Crossing Number (CN) strategy which removes the edge endings and bifurcations from the skeleton picture by inspecting the nearby neighborhoods of each edge pixel utilizing a 3 x 3 window.

Biometrics advances utilizes qualities, for instance, retina models, finger prints, ever rises, human faces, handprints, human voice, physically composed imprints, and so on, to check character. The other way that is taken after is the teacher passes the sheet around the class for the students to sign other than their names. Yet, these strategies have a noteworthy disadvantage where the false issues may turn out to be more continuous if the class quality ishigh.

An answer for defeat these issues are by utilizing a framework that will record the participation consequently.

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Toward this path, this task shows a unique finger print based biometric attendance that records the candidates consequently.

This record comprises of a unique mark sensor which is utilized to recognize the individual's distinguishing proof. For instance, for getting the participation, the understudy needs to put their finger on the unique mark sensor to get their participation. The caught unique mark is recorded instantly memory and checked each opportunity to discover whether the unique finger print matches with record in the blaze memory after which the understudy get their participation.

II. METHODOLOGY

The attendance system gives references to able experts. Nowadays magnetic cards are generally used to mark presence. The demerit of this system is easily misplaced and even the card will break. There are lots of literature survey for attendance system and management. Fingerprint recognition has a great deal of points of interest, for example, one of a kind, perpetual, great hostile to phony and simple to use. So it is perceived more and more by intuitions. Recently the Zigbee innovation is emerging in wireless communication. Contrasting and some current remote correspondence advancement, the Zigbee has points of interest in low-power and ease [2]. Investigating the weaknesses of conventional wire participation framework, a strategy for remote unique mark participation framework in light of Zigbee innovation is proposed. It utilizes unique mark ID for participation administration. . It gives ease, low-power and elite unique mark data procurement, transmission and acknowledgment work. In this paper finish improvement and utilization of the help interest structure is given.

Two sections in fingerprint identification are Fingerprint enrolment and fingerprint matching. While selecting the user needs to place the finger two times on the sensor. The gadget produces a layout by taking pictures. The format would then be able to be put away in the library. For unique finger impression coordinating, the user again needs to put his finger twice. For coordinating, the format is contrasted and every one of the layouts in the library [3]. The proposed system wipes out the downsides of the current system, theRTC is used to show the time and date in the LCD show and the GSM module is interfaced to shoot the message to the guardians of physically not present students.

The controller marks the attendance of student in the database when the student puts the finger on the fingerprint sensor. The missing understudies were tallied and the message will be send by the GSM innovation to the

understudy's folks exclusively. With the help of ZigBee communication, the databases of the students are transmitted to PC and stored. The absentee's counts were also taken and the message was sent by the GSM.
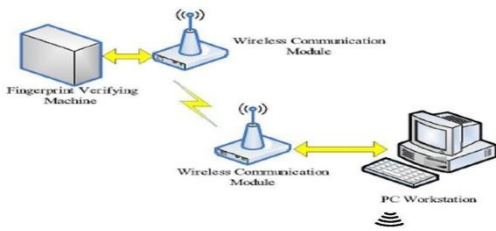
III. GENERAL BLOCK DIAGRAM

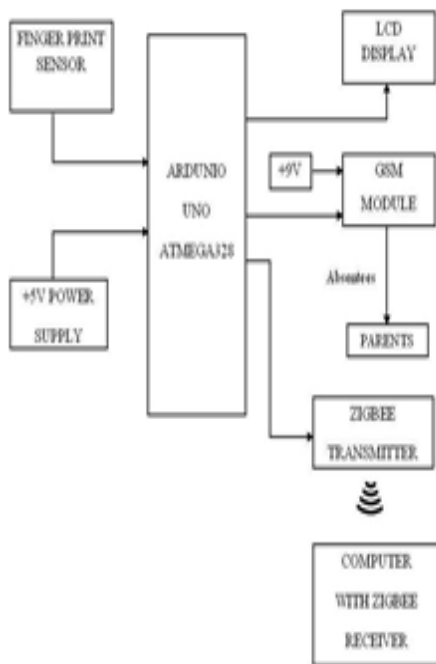**Fig. 1. Process of ZigBee Technology in Smart Attendance System**

Fig. 2. General Main diagram

A. Main diagram explanation

The importantgoal of this paper is to make the attendance system easy, time saving and reduce of the fraudulent marking of the attendance in the classroom. Here the students fingerprint is takes as the image and the student Identifications are saved in the fingerprint receiver through the microcontroller of ATMEGA 328 by the Arduino UNO kit. The supply to the Arduino UNO kit is fed by the 5volt adapter. When the student places their finger before the entering the class, it matches the student id and then mark the attendance for the particular student. This continues until the class starts and ends at the particular time i.e., after the class starts. The real time clock modules are placed to display the date and time through the LCD display. The LCD display also shows the student id and name when the student marking the attendance and it also shows that same student marking the attendance again and displayed as the student already fed the attendance.

When the student mark the attendance and the database of present student is sent to the computer system

through the ZigBee technology that the ZigBee transmitter is connected to the Arduino and the computer system with ZigBee 12 receiver by the RS232 to USB cable. After the starting of the class the absentee's student database also sent to the computer through the ZigBee transmitter and receiver. This reduces the time and easiest way of marking the attendance for the student. In addition to this the GSM Module SIM 900A is also connected to this project that it send the messages to the student's parents about his son/daughter present or absent in the classroom. When the time exceed at the certain limit the GSM Module sends the message to the present and absentees list to the department and the absent student's parent will receive the message individually that their son/daughter absent to the class.

IV. WORKING PRINCIPLES OF FRINTPRINT SENSOR

A. Image possession and augmentation

The understudy fingerprints are taken by utilizing unique mark sensor module. The finger module has an internal memory which can store around 100 pictures in it. These photos are utilized for the upgrade in next stages.

Histogram Equalization is utilized in picture upgrade [4].It is only the chart plot for number of pixels against the dim dimension. The general difference of the picture is made uniform and picture looks upgraded. Presently the picture is reasonable for the extraction of particulars extraction B.

B. Edge recognition

Two sorts of concealing are used here. They are level covering and vertical veiling. The administrators like Prewitt, Laplacian, Sobels, and Robertson Operators are utilized for recognizing the edges [5].The Prewitt administrators is remarkable among different edges distinguishing administrator and we are executing Prewitt administrator in this paper. The edges must be perceived to facilitate the data picture with authoritatively spared picture. Edges are determined by utilizing contrast between relating pixel powers of a photograph. Every last one of the spreads that are utilized for edge disclosure is by and large called assistant shroud. Since as we have imparted as a rule before in this game-plan of instructional exercises that photograph is in like way a standard so changes in a pennant must be figured utilizing separation.

C. Extraction of Miniature Points and Matching

After the extraction of edges, the centers are separate in it. Those centers which are recognized after edge area are known as downsized centers. The littler than anticipated centers that are isolated are differentiated and right presently secured pictures [6]. In order to find the planning methodology the association factor and the Euclidean detachment must be found. In light of the versatility regard the organizing results can be found.

V. GSM MODULE

GSM/GPRS TTL – Modem is worked with SIMCOM Make SIM900 Quad-band GSM/GPRS motor, takes a shot at frequencies 850 MHz, 900 MHz, 1800 MHz and 1900 MHz .The Modem is planned with 3V3/5V TTL interfacing hardware, which enables you to specifically interface to 5V

Microcontroller (Arduino) and in addition 3V3 Microcontrollers (ARM,ARM Cortex XX, etc.).The baud rate can be configurable from9600-115200 through AT order.

At first Modem is in Auto baud mode. This GSM/GPRS TTL Modem is having interior TCP/IP stack to empower you to interface with web by means of GPRS. It is appropriate for SMS and in addition DATA move application in M2M interface.The standard explanation behind the GSM in endeavors is to send and get the messages. Regardless, not simply that we can make a call and would we have the capacity to moreover examine using the GSM [7]. The GSM has the working voltage of 12v. It has generally of three sticks to be explicit transmitter, ground and the gatherer stick. To play out these assignments, a GSM modem must help a "connected AT request set" for sending/tolerating SMS messages. GSM is a champion among the most significant advancements in the front line world. It has various focal points than other development standards. The Advantages of GSM are, generally speaking meandering security and Reasonable contraptions and workplaces Extensive extents reachable.
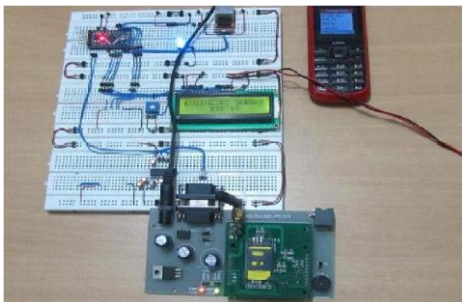

Fig. 3. Interfacing of GSM module

VI. COMMUNICATION OF MODULES WITH CONTROLLER

The output from the fingerprint sensor is stored and analyzed in microcontroller. Hereby we use "ATMEGA 16" microcontroller in this paper. The result from the sensor is received by microcontroller. If the stored image and input image are matched then microcontroller will sent signal to the Zigbee module. The Zigbee will send signals to the personal computer [8]. But, if the fingerprints are mismatched then the control signal will be sent to the GSM module.

After the delay the details of the students who are absent were taken and message of "NOT PRESENT "is sent to their individual parent's mobile numbers. So, the parents may know about the student's presence immediately. The Students cannot forget this system easily.

VII. RESULT

Wireless attendance system is implementented on a particular time and then students are started to mark their attendance and results are displayed which is shown following steps.

A. Device on

Fig. 4. Date and Time with Welcome Note

The figure 4 shows when the device is ON the LCD display shows the present date and time with welcome note.

B. Student enter

Student ID and Name is displayed when the student placed his/her finger on the fingerprint sensor.

Fig 5:Student ID and Name

C. Existing Systems

The figure 6 shows when the student again placed his/her finger on the fingerprint sensor the LCD shows that the attendance is already fed up.

Fig 6.ID result already exists

D. Unknown Student ID

The figure 7 shows when the unknown student placed his/her finger on the fingerprint sensor the LCD display show unknown student Id.

Fig. 7. Unknown Student ID

E. Cool term display

The figure 8 the students present and absent list through the zigbee technology
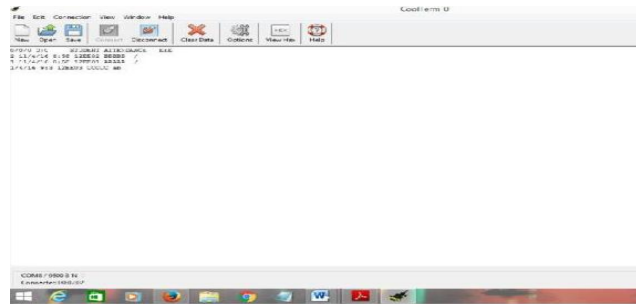

Fig. 8. Cool Term The figure 8 the students present an technology

VIII. CONCLUSION

In this project we take the student attendance system automatically by using the fingerprint sensor. The students present and absent list are generated on the computer system automatically by connecting the ZigBeetechnology.

The student who are absent in the class are marked and the message is sent to the student's parent individually by GSM technology. Thus, the student attendance system is made easy with this system. In this project we take only the attendance of the student for the present day, but we can take the attendance of the student by hour wise, and also it only takes the entering or check in of the student into the class.

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