

# Wireless Biometric Student Attendance System

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**Abstract**—Automated attendance system is a very modern technique, which is the best replacement to bulky, time consuming manually fed attendance system. It is considered to be the most efficient and trustworthy invention and has a noteworthy impact on both big and small institutes as well as industries. This project aims to build a wireless smart attendance system, which works on WIFI (802.11b) technology. In this system the stored data of attendance in each period after all the students recorded their fingerprint; it transmits to the web page of students list. A comparison between stored attendance with the students list is done and the students recorded their fingerprint will be automatically marked present in the web page and rest all will be marked absent by default and it will save the attendance in the web page for further use. This system will enable the facilitator to take hassle free, accurate, fast attendance. It will create punctuality among the students as within the stipulated time it will transmit the data to the web page.

**Keywords:** *Wireless Biometric Attendance System, Biometrics, WIFI (802.11b), Embedded Systems, Fingerprint Identification, Attendance System, Wireless Communication.*

## I. INTRODUCTION

Technology is increasingly weaving its way into our daily lives, and most of it is helpful and makes life easier. Inventions of machines have led us to optimize productivity. Biometric time and attendance system is such a machine, which has brought more precise system to measure group or individual's activities and attendance as well. Biometric time attendance system used to track each and every person coming to your place is actually who he claims to be or not with its time and other details. It uses finger/face recognition system to verify person's.

Identity and record its time-in and time-out with all required details.

Wireless Biometric attendance system works on advanced technology in which when a faculty enters the classroom he/she gives his/her fingerprint and activates the device, and then the device is passed to the students after all the students give their fingerprint once again the faculty gives his/her fingerprint to inform the device that the attendance marking is finished. After the fingerprint process the data is sent to the central

embedded server which is connected to computer, all the data bifurcations are done in the central embedded server but not in the PC. The PC is used to update the data in the Webpage such that it can be used for further manipulations. The main advantage of using Central Embedded server is many people know how to hack the computer and change the data but to do something in embedded system one must know it properly.

Some Major advantages of this device are:

- Reduction of paper work (i.e. Attendance register) of facilitator.
- Reduction of time which is being spent for taking attendance.
- Easy to carry as the device is very compact.
- Easy to use as it is very simple.
- Centralised control and there would not be any proxy.
- Parents can view their child's progress from the remotest part of the world.
- Fair attendance system.
- As central embedded server is used it is not easy to destroy the data.
- As it is completely wireless, the device is easy to handle & use.

The overall architecture/block diagram is shown in fig. 1 and the rest of this paper is organized as follows. In Section 2, we understand about the Hardware design, its working, and its complete details and whereas in Section 3, we will see the software part and its programming part and Section 4 illustrates the overview of the results and discussion of this present work, and conclusions are given in Section 5.

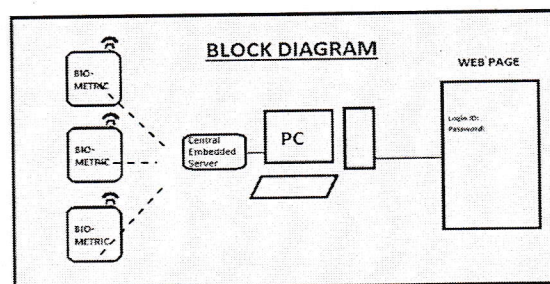


Fig. 1: Block Diagram of the System

## II. HARDWARES BIOMETRIC MODULE

### A. Embedded Server and Finger Print Sensor

The system hardware includes: Biometric module and Central Embedded Server Module.

Biometric Module (See Fig. 2) consists of Fingerprint sensor (R303A), Microcontroller (P89V51RD2), LCD (16x2), RF module (ST433/315 and STR433/315), 12V battery or 12V adapter.

Central embedded server as shown in fig. 3 consists of Microcontroller (P89V51RD2), RF module (ST433/315 and STR433/315), serial port (RS232 and MAX232), 12V DC power supply.

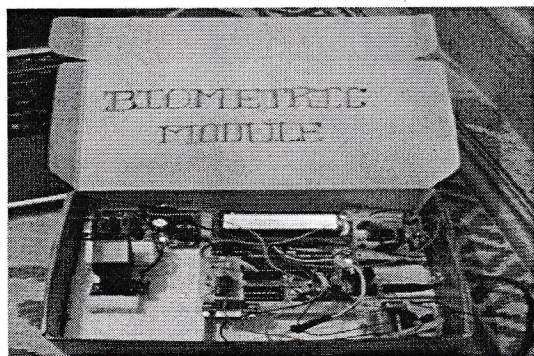


Fig. 2: Biometric Module

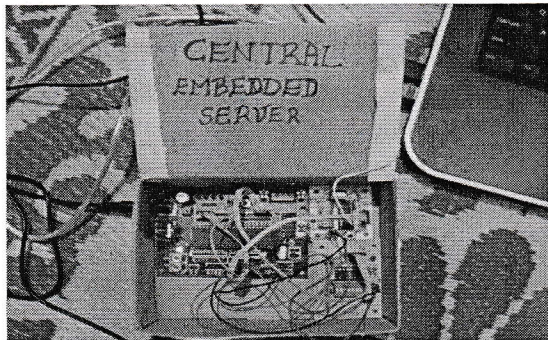


Fig. 3: Central Embedded Server

Fingerprint sensor (R303A)

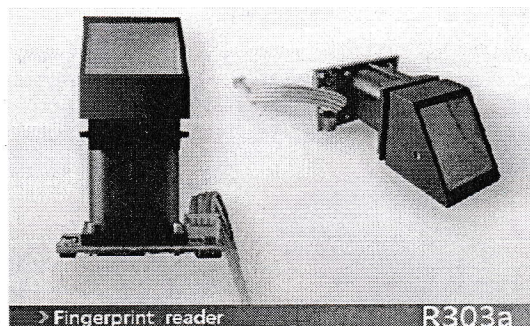


Fig. 4: Fingerprint Sensor

The R303A is high performance fingerprint module developed by SFG, it has many features: easy restructure, powerful functions, compatible with PC, and multiple-functions in one module: Fingerprint enrolment, image process, fingerprint template creation, fingerprint template storage, fingerprint compare (1:1, 1:N), fingerprint delete. This module can be interfaced with PC or MCU using RS232. Hence this module is used to store and compare the fingerprint of students and faculty.

### B. Microcontroller Details

The NXP (founded by Philips) P89V51RD2 is a 40MHz, 5 Volt 8051-based Microcontroller with 32 I/O lines, 3 Timers/Counters, 9 Interrupts/4 priority levels, 64K+8K FLASH, 1K on-chip RAM, SPI, Dual Data Pointers, WDT, 5-channel PCA and no need of external programmer.

### C. LCD

LCD display (16X2) is used to display the ongoing process like 'gen image', 'keep finger', 'and add/delete lecturer', 'welcome message' etc. It displays 16 characters in two lines. Some of the images are shown in Fig. 4(i), Fig. 4(ii), Fig. 4(iii) and Fig. 4(iv).

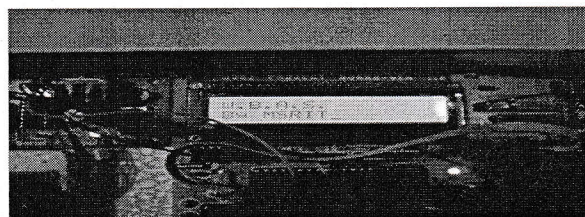


Fig. 4(i)

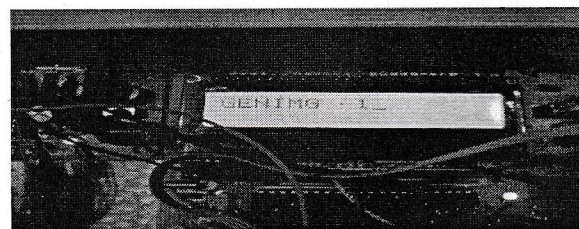


Fig. 4(ii)



Fig. 4(iii)

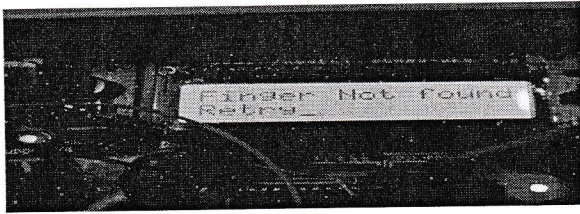


Fig. 4(iv)

Fig. 4: LCD Display

### III. RF MODULE

For transmission and reception of data/command between Biometric module and central embedded server wirelessly RF Module is used. It has 4 parts RF transmitter module, RF receiver module, Transmitter encoder and Receiver decoder. It is low cost and suitable for high volume application and is of small size and it is ideal for battery powered applications. It has a Frequency Range of 433.92MHz.

### IV. SOFTWARE IMPLEMENTATION

Flash Magic is an application developed by embedded system academy to allow easily access the features of microcontroller devices. It provides different programming options such as verify after programming, gen block checksums, execute and others. It offers you the possibility to program a hex file. It is used to burn the program (.hex file) to the microcontroller.

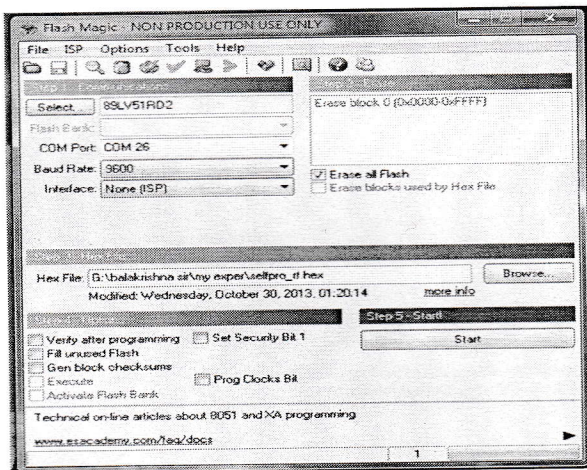


Fig. 5: Hyper Terminal of Flash Magic

Programming was done in C-language and debugging was done using Keil µvision 4.

### V. RESULTS

The Biometric attendance system scanned the fingerprints which were placed on the fingerprint device

and compared them against those stored in the database successfully. This system takes the attendance of the student and sends this attendance to the web page. The verification was done in hyper terminal of

flash magic and it was further implemented using php in web server to update in the website. fig. 6 shows the one of the student's attendance report.

Student	Calendar	Name: KUNJIBHATRE KUNAR RAO	Logout
Timeable	Schedule	Feedback form	Lesson Plan
Attendance	Attendance View	Summary: 15-Aug-2013 To 24-Nov-2013	Attendance
Student: KUNJIBHATRE KUNAR RAO	Class: E SEM IIE	Section: A	Roll No.: 2201
Sl. No	Subject	CP	CA
1	EEEC - Digital Signal Processing	40	30
2	EEEC - Control Systems	40	40
3	EEEC - Control Systems Lab	10	10
4	EEEC - Transmission and Distribution	30	30
5	PHYS - Engineering Physics - II	40	40
6	EEEC - Circuit and Measurements Lab	3	1
7	EEEC - Solar Photovoltaics	30	30
8	EEEC - Introduction to Embedded Systems	30	40
			100.00

Fig. 6: Student's Attendance Report

### VI. CONCLUSION

Wireless biometric student attendance system is a portable device and it can be an alternate for the existing manual attendance system. More over it is faster and error free compare to the sytems in existence.

### ACKNOWLEDGEMENT

We would like thank Mrs. Kusumika Krori Dutta, Asst. Prof. in EEE department, MSRIT for her support and guidance.

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