"BIOMETRIC ATTENDANCE SYSTEM"

A MINOR PROJECT-I REPORT

Submitted by

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BACHELORS OF TECHNOLOGY
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Under the supervision of

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DECLARATION

I, **Mr. Sadiq ali** a student of **Bachelors of Technology (Electronics and Communication) (BTECE),(Enrolment No: 2017-333-088)** hereby declare that the dissertation entitled **"Biometric Attendance System"** which is being submitted by me to the Department of Computer Science, Jamia Hamdard, New Delhi in partial fulfillment of the requirement for the award of the degree of **Bachelors of Technology (Electronics and Communication) (BTECE),** is my original work and has not been submitted anywhere else for the award of any Degree, Diploma, Associateship, Fellowship or other similar title or recognition.

(Signature and Name of the Applicant)

Date:

Place:

ACKNOWLEDGEMENT

It is my privilege to express my sincerest regards to our project supervisor,
Dr. Safdar Tanweer , for his valuable inputs, able guidance, encouragement, whole-hearted cooperation and constructive criticism throughout the duration of my project. And i take this opportunity to thank all our lecturers who have directly or indirectly helped me in my project.

(Signature and Name of the Applicant)

Date:

INTRODUCTION

Biometrics refers to the automatic Identification, Verification & Registration of a person based on his or her physiological or behavioral characteristics.

What is Biometric Attendance System?

It is the process of automatically matching one or many unknown fingerprints against a database of known and unknown prints.

Attendance systems are commonly used systems to mark the presence in offices and schools. From manually marking the attendance in attendance registers to using high-tech applications and biometric systems, these systems have improved significantly. In this project, I used fingerprint Module and Arduino to take and keep attendance data and records. By using fingerprint sensor, the system will become more secure for the users.

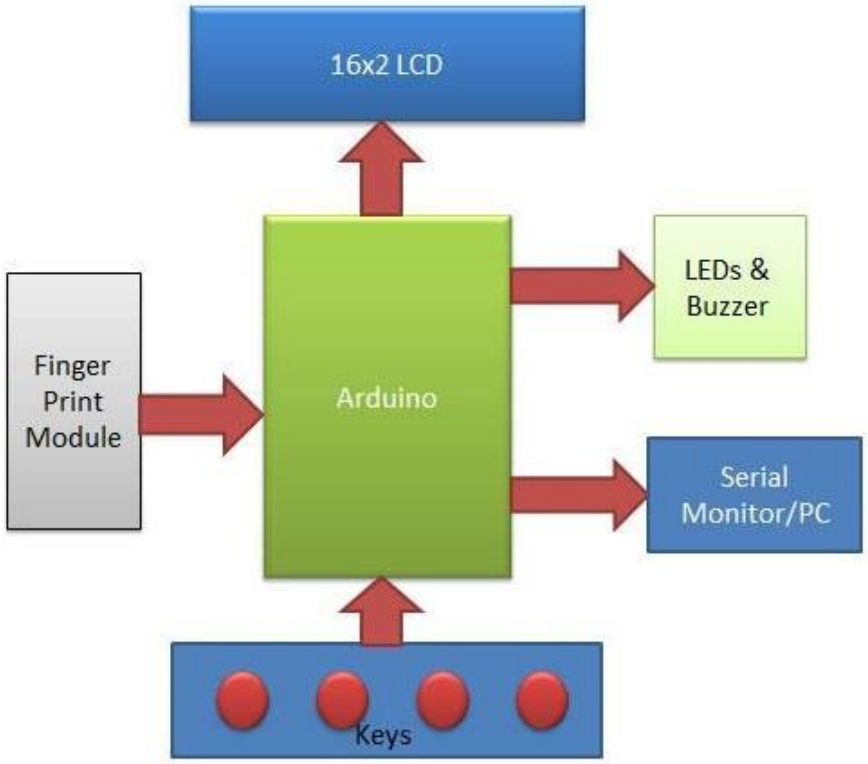
Following sections explains technical details of making a fingerprint based biometric attendance system using Arduino.

Its main objective to digitize the process of attendance and save paper !

SYSTEM MODEL AND LITERATURE SURVEY

In this biometric attendance system circuit, we used Fingerprint Sensor module to authenticate a true person by taking their finger input in the system. Here we are using 4 push buttons to enroll, Delete, UP/Down. ENROLL and DEL key has triple features. ENROLL key is used for enrollment of a new person into the system. So when the user wants to enroll new finger then he/she need to press ENROLL key, where user want to be store the finger print image. Now if at this time user does not want to proceed further then he/she can press ENROLL key again to go back. This time ENROLL key behave as Back key, i.e. ENROLL key has both enrollment and back function. Besides enroll key is also used to download attendance data over serial monitor. Similarly, DEL/OK key also has the same double function like when user enrolls new finger, then he/she need to select finger ID by using another two key namely UP and DOWN. Now user need to press DEL/OK key (this time this key behave like OK) to proceed with selected ID. And Del key is used for reset or delete data from EEPROM of Arduino.

BLOCK DIAGRAM



WORKING

Working of this biometric attendance system project is fairly simple. First of all, the user needs to enroll fingerprints of the user with the help of push buttons. To do this, user need to press ENROLL key and select the ID for the fingerprint to save it in memory by ID name. So now user needs to enter ID by using UP/DOWN keys. After selecting ID, user needs to press OK key. Now LCD will ask to place finger over the fingerprint module. Now user needs to place his finger over finger print module and then the module takes finger image. Now the LCD will say to remove finger from fingerprint module, and again ask to place finger again. Now user needs to put his finger again and module takes an image and converts it into templates and stores it by selected ID into the finger print module's memory. Now the user will be registered and he/she can feed attendance by putting their finger over fingerprint module. By the same method, all the users will be registered into the system.

Every time an users marks his attendance, it will be stored into the arduino's eeprom with exact date and time. So that it can be checked whenever required.

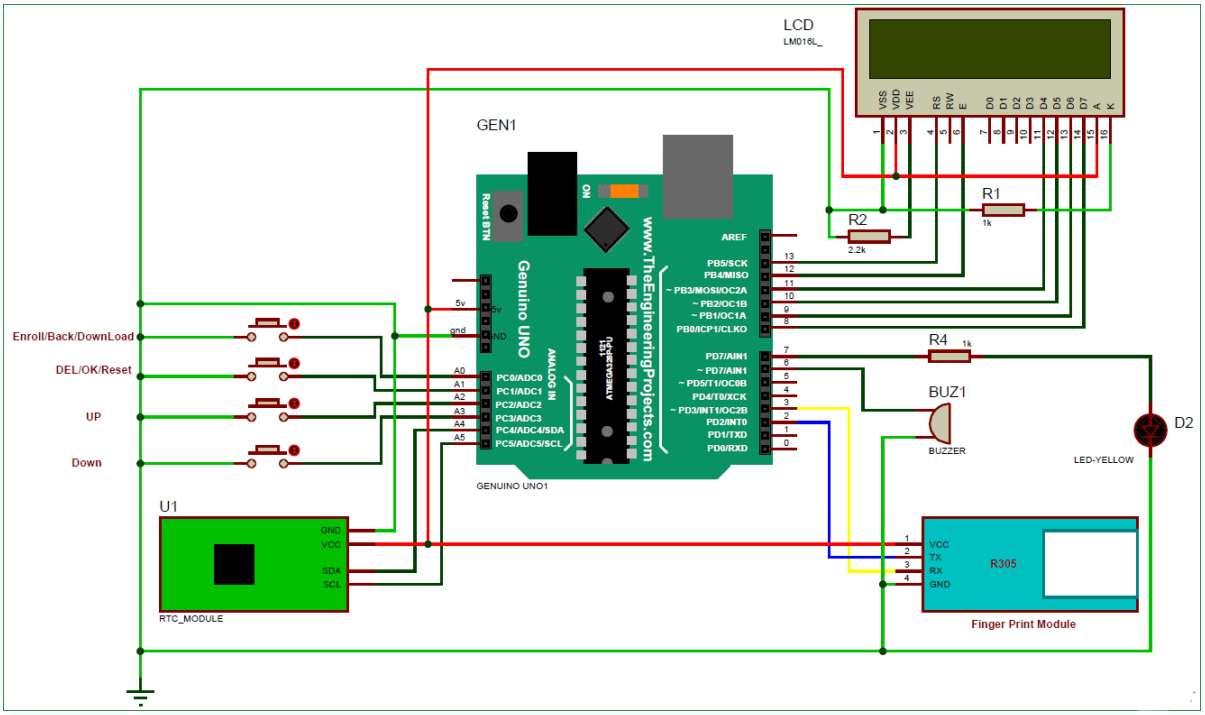
HARDWARE DESCRIPTION

Whenever user place his finger over fingerprint module then fingerprint module captures finger image, and search if any ID is associated with this fingerprint in the system. If fingerprint ID is detected then LCD will show Attendance registered and in the same time buzzer will beep once and LED will turn off until the system is ready to take input again.

Along with the fingerprint module, i have also used an RTC module for Time and date. Time and date are running continuously in the system. So Arduino take time and date whenever a user marls his/her attendance over fingerprint and save them in the EEPROM at the allotted slot of memory.

Here I have created 5 user space in this system for 30 days. By pressing the RESET button in Arduino and then immediately enroll key will be responsible for downloading attendance data over serial monitor from the Arduino EEPROM Memory.

CIRCUIT DIAGRAM



LIST OF COMPONENTS

1. Arduino
2. Finger print module
3. Push Button
4. LEDs
5. 2.2K resistor
6. Power
7. Connecting wires
8. Box
9. Buzzer
10. 16x2 LCD
11. Bread Board
12. RTC Module

DESCRIPTION OF COMPOMENTS

R 307 Fingerprint sensor module captures finger's print image and then converts it into the equivalent template and saves them into its memory as per selected ID by Arduino.

All the process is commanded by Arduino like taking an image of finger's print, convert it into templates and storing as ID etc.

LED indicates that fingerprint module is ready to take an image of the finger.

A buzzer is also used for various indications like attendance registration etc.

Arduino is the main component of this system it is responsible for control of the whole system.

R307 FINGERPRINT MODULE

R307 Fingerprint Module consists of optical fingerprint sensor, high-speed DSP processor, high-performance fingerprint alignment algorithm, high-capacity FLASH chips and other hardware and software composition, stable performance, simple structure, with fingerprint entry, image processing, fingerprint matching, search and template storage and other functions.

The R307 fingerprint module has two interface TTL UART and USB2.0, USB2.0 interface can be connected to the computer; RS232 interface is a TTL level.

RTC MODULE

The DS1307 serial real-time clock (RTC) is a low-power, full binary-coded decimal (BCD) clock/calendar plus 56 bytes of NV SRAM. Address and data are transferred serially through an I²C, bidirectional bus. The clock/calendar provides seconds, minutes, hours, day, date, month, and year information. The clock operates in either the 24-hour or 12-hour format with AM/PM indicator. The DS1307 has a built-in power-sense circuit that detects power failures and automatically switches to the backup supply. Timekeeping operation continues while the part operates from the backup supply.

ARDUINO

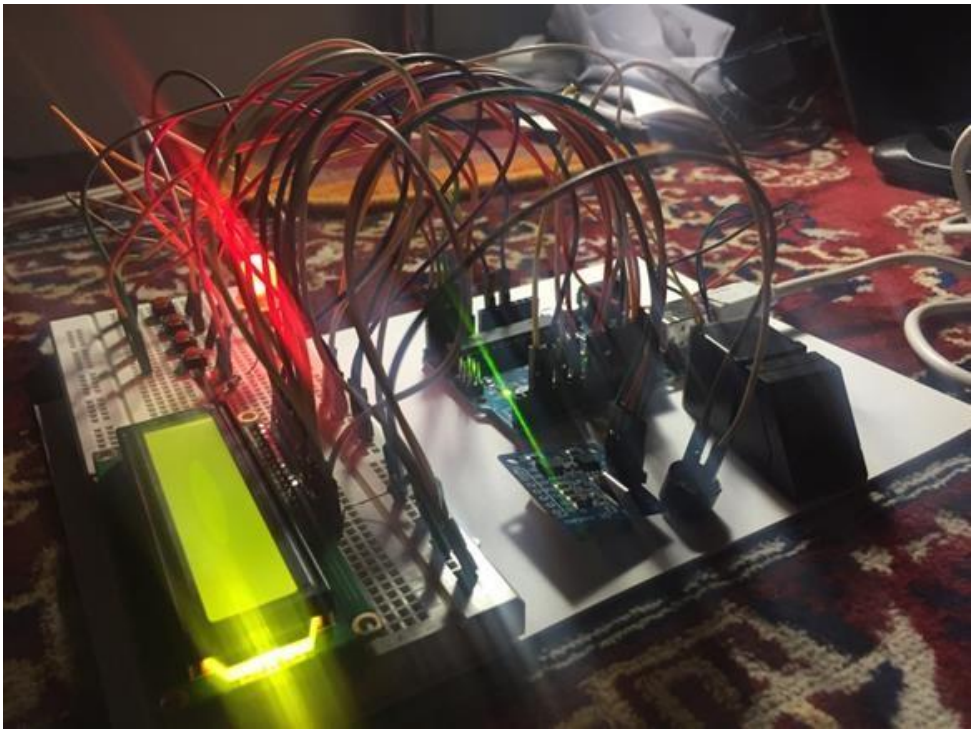
Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

IMPLEMENTATION AND DEBUGGING

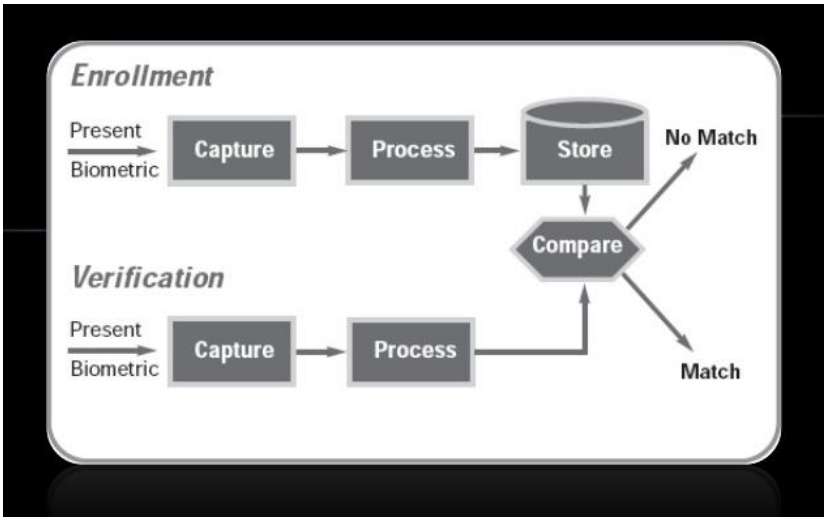
This project was implemented with the help of the given circuit diagram and all the connections were made correct. The programming was done in arduino through the software ‘Arduino IDE’ i.e. arduino integrated development environment.

Initially some problems were faced but they were corrected as the project progressed. The fingerprint captures the fingerprint image and transfers it to the arduino’s memory in equivalent form.

LED indicates that the fingerprint is ready to take the finger image and the buzzer makes sound when a fingerprint enrollment is successful and whenever an attendance is recorded.



PROCESS CONTROL BLOCK



This attendance management system uses fingerprint identification. In identification, the system first captures the person's biometrics and stores it in the memory and then at the time of attendance it recognizes the person by comparing his/her biometrics with every record in the database.

In general, biometric identification consists of two stages:

i. Enrollment

ii. Authentication

CONCLUSIONS AND FUTURE SCOPE

Now a days, Information systems and Communication Technologies (ICT) are becoming more and more improved. Biometric technology is also an effective tool to identify and detect fraudulent issues. A fingerprint-based attendance system is presented in this paper. This system will enhance the ability to detect the presence of the students in class or employees in an organization. In terms of efficiency and performance, fingerprint based attendance system is used in many places. This system is user-friendly and reliable because this system displays name, the ID numbers, date and time. Otherwise, this attendance system can be implemented to check which person reached the work in time or on time or late time. So, this developed system is very also useful in saving valuable time of students and lectures, paper, generating report at required time.

The future scope of this biometric attendance system is that much advancement can be done in it for e.g. by adding a Wi-Fi or a Bluetooth module the attendance data can be recorded directly in the system. This attendance system can also be made through technologies based on RFID and IOT.

A SD card slot can also be attached to the system and that card can be used to view the data.

And also this system can also be used as a ‘biometric security system’ which I hope to make in the next semester.

REFERENCES

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Sunrom.com – R307 Fingerprint inputs and parameters