REVIEW OF RESEARCH
ISSN: 2249-894X
UGC APPROVED JOURNAL NO. 48514
IMPACT FACTOR : 5.2331(UIF)
VOLUME - 7 | ISSUE - 3 | DECEMBER – 2017

ELECTRONIC ATTENDANCE SYSTEM BASED ON FINGERPRINT

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ABSTRACT:

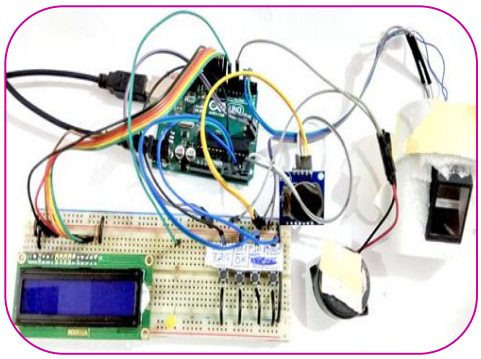
The Research Paper presents an Electronic Attendance System based on fingerprint. This System records the attendance of person by using a hand held Fingerprint Sensor. This system also records the attendance of students in school and colleges. For student identification, a fingerprint recognition based identification system is used. Fingerprints are considered to be the best and fastest method for biometric identification. They are secure to use, unique for every person and do not change in one's lifetime. we have designed portable module of attendance system which work on battery and give high accuracy and save time of student as well as teacher. In this System we have used a Arduino mega 2560 , it to control all the function . It acts as a brain of our System. we also uses GT 511C3 finger print sensor module, it is input device and it plays very important role in finger print attendance system. we use memory module to store the data of attendance.

KEYWORDS: *Biometric, Fingerprint, Attendance, Optical sensor, Arduino.*

INTRODUCTION:

Attendance is a concept that exists in different places like schools, colleges, organizations, hospitals, etc. from the start and end of the day to mark a person's presence. Every organization whether it be an educational institution or business organization, it has to maintain a proper record of student attendance or employees for effective functioning of organization. Designing a better attendance management system for students, so that records be maintained with ease and accuracy was an important key behind motivating this system. Also we are designing this system in the portable device. This would improve accuracy of attendance records because it will remove all the class of roll calling and will save valuable time of the students as well as teachers. We use to taking attendance of student through a fingerprint module.

We have designed a portable device which is used to maintain a proper record of student attendance. It is a low costly as well as higher accuracy device. But now days in colleges this type of attendance management system or device is not available. Traditional way of taking attendance in school or colleges is teacher announcing the roll number of student and mark attendance on attendance sheet. At time of announcing roll number the voice of teacher is not hearing by student then that student attendance mark as absent i.e. improper technique of taking attendance. And some time when teacher announcing roll numbers then any another student giving attendance that is proxy this is not right way of



taking attendance. Management of attendance record is more tedious thing in school or colleges.
Biometric Identification Systems are widely used for unique identification of humans. Mainly for verification and identification Biometrics is used as a form of identity. Access management and access control. So use of biometrics in student attendance management system is a secure approach. There are many types of biometric systems like fingerprint recognition, face recognition, voice recognition, iris recognition, palm recognition etc. In this, we used fingerprint recognition system. We uses in this GT51C3 fingerprint module, also there is number of fingerprint models available in market.

LITRATURE SURVEY

In many of the institutes average student count in one classroom is near about 100. Students have to mark their attendance in every hour. Using conventional method of calling out names for attendance, it takes approximately 5 to 10 minutes for marking attendance of entire class. Then in a 42 hour subject (which is the normal duration of a subject), approximately 7 hours is used for marking attendances. Some faculty members use signature method (explained before) also for attendance marking. Many organizations use fingerprint attendance system for marking attendances of their employees. These are computer connected devices in which database of employees are stored in computer and these are fixed at specific location. But the situation in a classroom is different. Students cannot come near the device to mark the attendance in a class room.

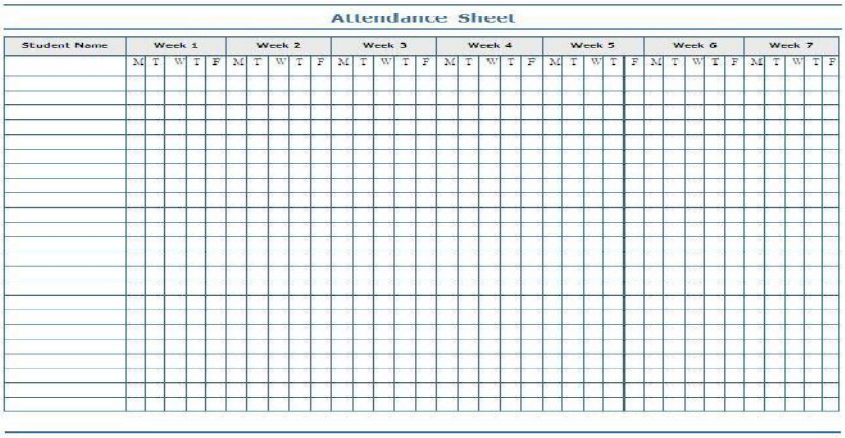


Figure.1 Traditional Attendance System

OVERVIEW

Fingerprint processing includes two parts: fingerprint enrollment and fingerprint matching (the matching can be 1:1 or 1:N). When enrolling, user needs to enter the finger two times. The system will process the two time finger images, generate a template of the finger based on processing results and store the template. When matching, user enters the finger through optical sensor and system will generate a template of the finger and compare it with templates of the finger library. For 1:1 matching, system will compare the live finger with specific template designated in the Module; for 1:N matching, or searching, system will search the whole finger library for the matching finger. In both circumstances, system will return the matching result, success or failure.

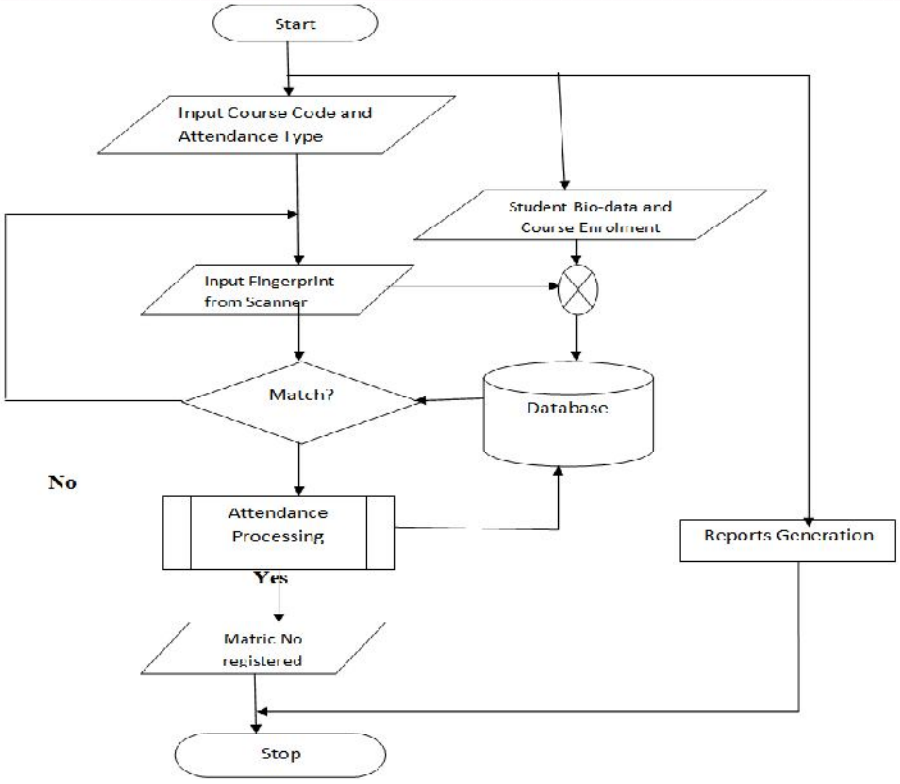


Figure.2 Flowchart

Arduino:- Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or Environment. Arduino is a **microcontroller** on a circuit board which makes it easy to receive inputs and drive outputs. A microcontroller is a integrated computer on a chip. Some examples of inputs would be a temperature sensor, a motion sensor, a distance sensor, a switch and so forth .Some examples of outputs would be a light, a screen, a motor and so forth. Arduino is a small computer that you can program to read and control electrical components connected to it. There are several online distributors that stock Arduino boards. Often boards are bundled up with starter kits. Kits include a wide variety of inputs, outputs, resistors, wires and breadboards. Breadboards are solderles circuit prototyping boards that you can plug wires and components into Arduinos come in different flavours. Most people starting off go for the UNO board. It's current revision is the third, hence the R3 listed by stockiest .Most enthusiasts use sites like A dafruit and Element14.You can even pick up one from your local Radio Shack .A more complete list of distributors can be found on the Arduino Distributors page .If you're just getting a single Arduino board or starter kit be sure you have a USB A to B cable. Most, if not all, starter kits come with the USB A to B cable. Most printers have this type of interface so you may have this cable already lying around. The reason you need the cable is to program the device so it's best to double check when ordering.

Fingerprint Module(GT511C3):- The GT-511C3 FPS (fingerprint scanner) is a small embedded module that consists of an optical sensor mounted on a small circuit board. The optical sensor scans a fingerprint and the microcontroller and software provides the modules functionality which automatically processes the scanned fingerprint. The interface of the FPS is very basic consisting of only four pins power, ground, serial transmit and serial receive.

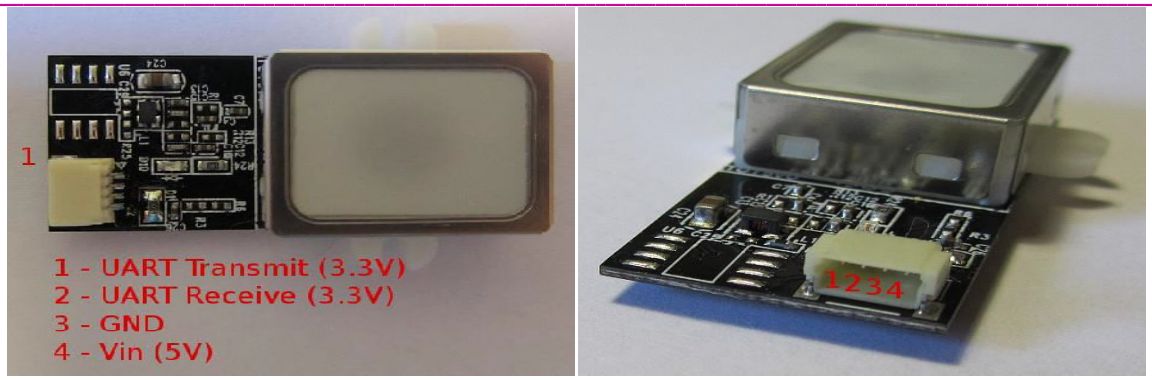


Figure.3 Fingerprint Module GT511C3

LCD (Liquid Crystal Display):- Alphanumeric displays are used in a wide range of applications, including palmtop computers, word processors, photocopiers, point of sale terminals, medical instruments, cellular phones, etc. The 16 x 2 intelligent alphanumeric dot matrix display is capable of displaying 224 different characters and symbols. A full list of the characters and symbols is printed on pages 7/8 (note these symbols can vary between brand of LCD used). This booklet provides all the technical specifications for connecting the unit, which requires a single power supply (+5V). LCD display is an inevitable part in almost all embedded projects and this article is about interfacing 16×2 LCD with 8051 microcontroller. Many guys find it hard to interface LCD module with the 8051 but the fact is that if you learn it properly, its a very easy job and by knowing it you can easily design embedded projects like digital voltmeter / ammeter, digital clock, home automation displays, status indicator display, digital code locks, digital speedometer/ odometer, display for music players etc. Thoroughly going through this article will make you able to display any text (including the extended characters) on any part of the 16×2 display screen. In order to understand the interfacing first you have to know about the 16×2 LCD module.

Memory Module:- The memory module is used for initialize the SD card to the Arduino system. Memory card is used for store the result. The following figure shows how memory module is connected to the Arduino MEGA and Arduino UNO.

IMPLEMENTATION

To enroll new finger to device: To enroll new finger to the device first we have to connect our device to the host computer. then open ARDUINO software and run enroll program. it can be done in following three steps :

1. Place finger to enroll
2. Place finger once again
3. Id verified or not verified

When we successfully enroll students finger to the machine then the device is ready to use. we have to simply move this device in class. when student give their finger to device it will record their attendance. This attendance is record in memory card by the memory module. So user can store this attendance and upload when it is needed. it operate as follows

1. When we switch on device it shows welcome message
2. Place finger to attendance
3. Attendance is taken

CONCLUSION

This Wireless fingerprint attendance system is elegant and efficient way to track the presence of students in the class over an entire semester for various courses. It also gives easy interface to get detailed information of relevant queries. Using this attendance system, Professor can get the attendance of a

particular student throughout whole semester, attendance of whole class for a particular day and attendance of whole class throughout the semester in a tabular form within few seconds .

FUTURE SCOPE

1. To make GUI more user friendly, so that it saves professor's time in extracting data from updated data base.
2. To use another LED in Arduino Mega(2560) which will indicate that the attendance has been marked in the local database.
3. Develop the database for device.
4. Use WiFi module to upload result on server.

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