

ATTENDANCE MONITORING SYSTEM USING GSM

Tejas Kedare¹, Vinay Swami², Ankita Hande Deshmukh³, Vishakha Dumbre⁴, Prof. Amjad Shaikh⁵

¹B.E. Student, Department of Electronics and Telecommunication Engineering, Shivajirao S. Jondhale College of Engineering, Dombivli East, Thane, Maharashtra 421204, India.

⁵Professor of Electronics and Telecommunication Engineering, Department of Electronics and Telecommunication Engineering, Shivajirao S. Jondhale College of Engineering, Dombivli East, Thane, Maharashtra 421204, India.

Abstract- In the Recent World Completing the work with simplicity and less time is very important thus Attendance Monitoring System Records Attendance without any flaws and keeps track of Individual Person within seconds. We developed this system using atmel Microprocessor on arduino board, the Fingerprint sensor module is used to capture the fingerprints and GSM module is used to transmit the recorded data. Schools, Colleges, Offices, Industries can utilise this system and keep track of the people. RTC, LCD and Memory modules are used to save Time Data and Display them.

Key Words: Attendance Monitoring, GSM, Fingerprint Sensor, Arduino, Real Time Clock

1. INTRODUCTION

Attendance system is important role for any organization such as office, companies, schools, universities and so on. In conventional attendance system, the teachers either call the name or identity number of the students or allow the students to sign on paper. It is not convenient to track the attendance for the increase number of students. So, it can have the problems such as proxy attendance and time consuming. The most common means of tracking student attendance in the classroom is by the students to sign the attendance sheet manually, which is normally circulated around the classroom while the lecturer is conducting the lecture. There are numerous disadvantages of using such system. The attendance sheet is circulated around the class; some students may accidentally or purposely sign another student's name. Another issue of having the hardcopy attendance record is that a lecturer may lose the attendance sheet. As a result of that, lecturer can no longer track the students overall attendance record throughout the particular semester. Currently, the magnetic card attendance system is extensively used. This pattern is flexible and practical. But it has also some disadvantages. For example, the card is frail it get damage easily and also because of its size it get's lost easily. And most of all, parents are unaware if their children are present in the class or not.

2. RELATED WORKS

Online students attendance monitoring system using RFID by Rajan Patel, Nimisha Patel. Smart Attendance monitoring system by Shubhobratha Bhattacharya, Gautam Sandeep Nainala, Prosenjit Das, Aurobinda Routray.

3. ISSUES TO BE ADDRESSED

The important aspect to be addressed is to store the biometric which requires memory module working as well as capturing the date and time in parallel to it. The biometric requires that the finger that is captured should be clean to match the saved biometric as the system does the work of matching of saved fingerprints. The system requires the saving of fingerprints according to their id numbers, Thus each person should keep their particular ID number fixed.

4. PROPOSED WORK

The proposed system uses Biometric scanning, the biometrics are presaved according to the ID numbers later while capturing the attendance the cpu does the work of matching the saved biometric thus avoiding the false attendance. The captured attendance their date and time is saved to the memory module. The SMS is sent to the Institution Head or Teachers or Parents for further clearance.

5. MODULE DESCRIPTION

We segmented our system into five modules. Fingerprint module captures the fingerprint and the data is stored into the memory module through microcontroller. The Arduino Board is interfaced to all the modules. Each module is programmed in arduino IDE. The RTC module provides the date and time. The LCD displays the ongoing operation. The data stored is sent as a message through GSM module. AT commands control the GSM module. The battery bank provides the power. Regulators are used to provide different voltages.

6. HARDWARE DESCRIPTION

6.1 Atmega Microcontroller

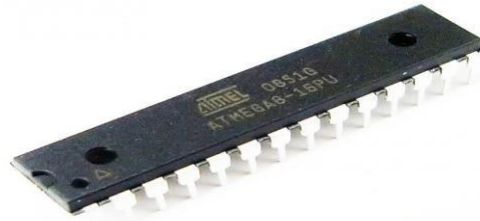


Fig -1: Atmega Microcontroller

The Microcontroller has the Harvard architecture that works swiftly with the RISC. The features of Atmega8 Microcontroller encompass different features in contrast with other like sleep modes-6, inbuilt Analog to Digital converter, internal oscillator and serial data communication, performs the instructions in a single execution cycle.

These Microcontrollers were very quick and they use less power to work in various power saving modes. There are various different configurations of AVR microcontrollers that are available to perform various operations like 8-bit, 16-bit, and 32-bit. It comes in three packages known as PDIP, MLF, and TQFP, where the first one contains 28 pins and the other two come with 32-pin on each module.

The Program memory is 8K Flash, enough to store a number of instructions while other two memories RAM and EEPROM contain 1K and 512 Bytes respectively. The Other features this module include are a, Brown out Detection, a watchdog timer, power-up timer, In-Circuit Serial Programming and five sleep modes

6.2 Arduino

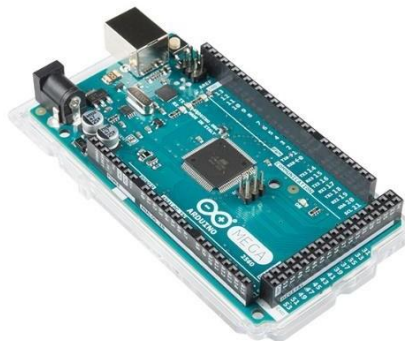


Fig -2: Arduino Board

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

The Arduino platform has become very popular with people who are new to electronics and IT projects, and for good reason. Not like the most previous programmable circuit boards, the Arduino don't need a separate piece of hardware in order to load new code onto the board, you can simply use a USB cable. Additionally, the Arduino IDE uses a version C++ it is easy to understand it is fast and has object oriented programming. Also, Arduino provides a standard function that breaks out the functions of the micro-controller into a more easily accessible package.

6.3 Lcd Display

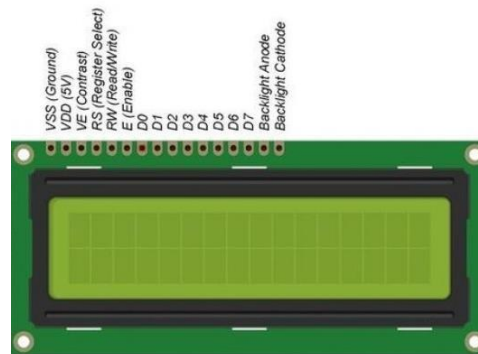


Fig -3: Lcd Display

The term LCD stands for liquid crystal display. It is unique electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly used for seven segments and multi-segment light-emitting diodes. The most important benefits of using this module are simply programmable, inexpensive, animations, and there are no limitations for displaying custom characters, and even animations, etc.

Features

1. The operating voltage of this LCD is 4.7V-5.3V
2. It includes two rows where each row can produce 16-characters.
3. The utilization of current is 1mA with no backlight
4. Every character can be built with a 5×8 pixel box
5. The alphanumeric LCDs alphabets & numbers

6.4 SIM 800L



Fig -4: SIM 800L

SIM800L GSM/GPRS module is a small version of GSM modem, which can be used in combination with a great number of IoT and electronics projects. This module can be used to achieve almost anything a standard cell phone can; SMS text messages, Make calls or receive calls, also connecting to internet through GPRS, TCP/IP, etc The best thing about this module is that it supports quad-band GSM/GPRS network, meaning it works pretty much anywhere in the world.

Features.

1. 2G Quad-band 850/900/1800/1900MHz
2. Receive and make calls using the speaker and microphone outputs
3. Receive and send SMS

6.5 Fingerprint Sensor

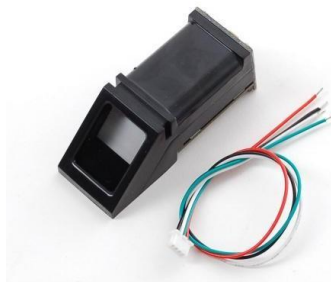


Fig -5: Fingerprint Sensor

BIOVO-C3 optical fingerprint module has high-performance matching algorithm, high-precision, and high-capacity flash chip. It operates on the basis of fingerprint image processing, matching, memory search and performance and desired functions. It uses serial communication in order to communicate with microcontroller. The default Baud Rate is 57600, and it can not be changed. It can store up to 200 fingerprint samples and you can directly connect it to a computer via USB.

Features:

1. Supply Voltage: 5V
2. Resolution: 500dpi
3. Storage Capacity: 200 PCs
4. Signature File: 256 bytes
5. Template Files: 512 bytes
6. Signature File: 256 bytes
7. Template Files: 512 bytes
8. Interface: UART (TTL)

Real Time Clock



Fig -6: Real Time Clock

A real-time clock is a battery-powered clock that is included in a microchip in a computer motherboard its abbreviation is RTC. The microchip is generally separate from the microprocessor and other chips and is simply called as "CMOS" which means complementary metal-oxide semiconductor. A tiny memory on this microchip stores system setup values including current time and the values stored by the real-time clock.. When the computer is turned on, the Basic Input-Output Operating System that is stored in the computer's read-only microchip uses thereal time clockk to read the current time from the memory in the chip

6.6 Power Supply



Fig -7: Power Supply

12V DC power supplies are one of the most common power supplies which are use today. Generally, a 12 volt DC output is obtained from a 120 volt AC or 240 volt AC input using a amalgamation of diodes transistors and, transformers. There are two types of 12V power supply: 12V regulated power supplies, and 12V unregulated power supplies. There are three types of 12V regulated power supply: Switching regulated AC to DC, Switching regulated DC to DC. And Linear regulated AC to DC.

7. SOFTWARE:-

7.1 The Arduino Integrated Development Environment

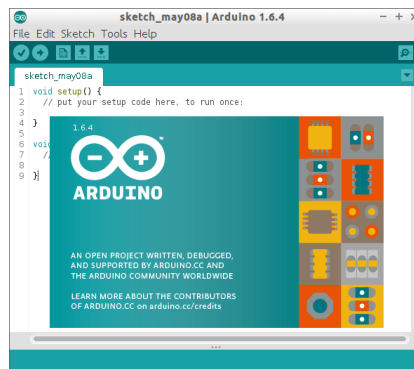


Fig -8: The Arduino Integrated Development Environment

Writing and compiling the code into the Arduino Module is done by an open source software that is Arduino IDE .The Arduino software makes code compilation very easy that even a common person with no prior technical knowledge can understand it

It is easily available for operating systems such as MAC, Windows, Linux and runs on the Java Platform which comes with inbuilt functions and commands that play a important role for editing, debugging and compiling the code

There are different types of Arduino modules such as Arduino Leonardo, Arduino Micro, Arduino Uno, Arduino Mega, and many more. Each of them has a microcontroller which is programmed and accepts the information in the form of code.

The main code known as a sketch which when created on the IDE platform will generate a Hex File which is then transferred and uploaded in the controller.

There are two main parts of the IDE: Editor and Compiler in which former is used for writing the required code and later is used for compiling and uploading the code which is given into the Arduino Module.

The IDE supports both C and C++ languages.

7.2 Embedded C

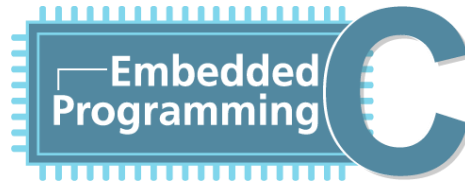


Fig -9: Embedded C

Embedded C Programming is the vital part of the processor functioning which is inside each and every embedded system that we come across in our daily life, for example cell phone, digital camera, and washing machine.

Each processor is associated with an embedded software. The first and the most important thing is the functioning of the embedded system is decided by the embedded software. For program the microcontroller Embedded C language is most frequently used.

7.3 Proteus Isis [System Design]

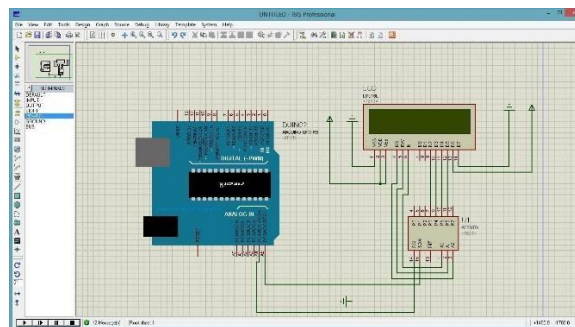


Fig -10: Proteus Isis

To draw schematics and simulate the circuits in real time the software used is Proteus Isis. Its has wide range of components in its library. It has signal generators, measurement, sources, and also has analysis tools such as voltmeter, ammeter, oscilloscope etc. probes which are use real time monitoring of the parameters of the circuit and many other components and accessories which makes system design easy

7.4 Proteus Ares [Pcb Design]

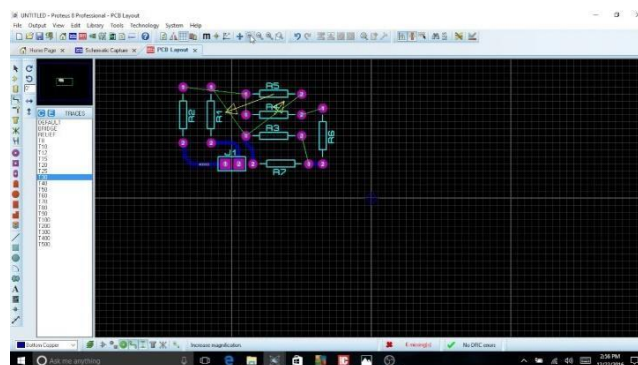


Fig -11: Proteus Ares

ARES which stands for Advanced Routing and Editing Software is the PCB layout module of the Proteus. Design Suite PCB designing up to 14 inner layers is offered by ARES, with both surface mount and through hole packages. It has options of different category of components such as transistors, headers, connectors, ICs and other important components. It offers both type of routing options which are Auto routing and manual routing options to the PCB Designer. The design drawn with the help of ISIS can be directly transferred ARES.

8. RESULTS

The system scans the fingerprints placed on the device with biometric sensor and then compared them with those which are stored in the database successfully.



Fig -12: Saving Fingerprint

Once all fingerprints are scanned and a fingerprint is missing then a message is sent through the GSM modem to the registered number

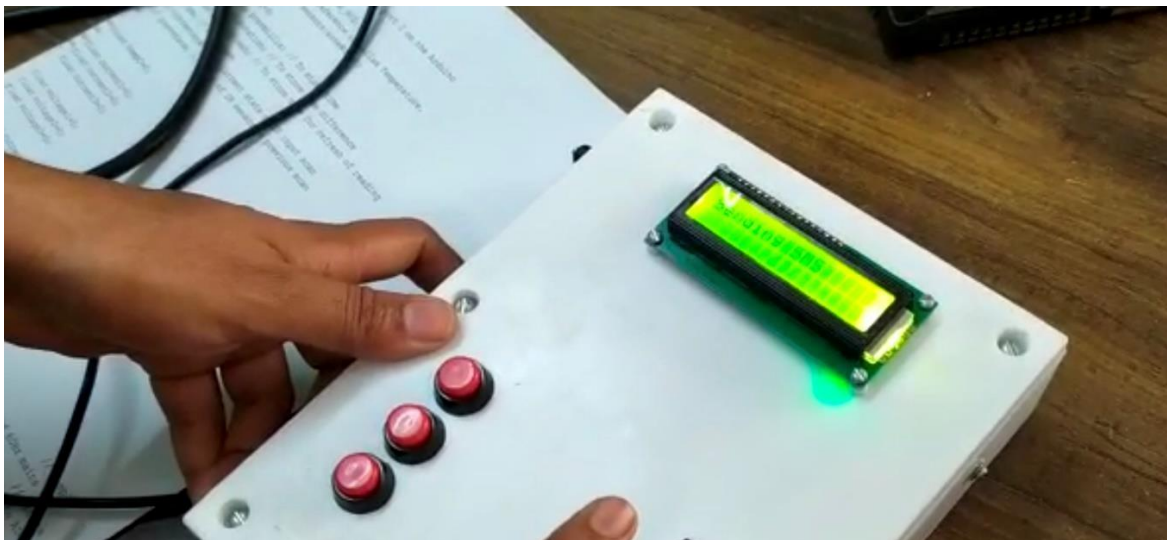


Fig -13: Sending SMS

9. CONCLUSIONS:-

The main purpose of this project is to monitor the students attendance in lecture in schools and colleges in more efficient way and send their attendance to their parents.

This system don't allow students to bunk classes because their absence will send SMS to parents.

From more than a decade for time Biometrics has been used effectively for attendance system. biometric attendance system is a cost effective and simple to use system. Each person has a unique fingerprint that cannot be shared.

Attendance system could not only speed up the process taking attendance but also reduce the error rate and produce faster verification process of authenticating student attendance.

10. REFERENCES:-

- [1] ChatratiSaiKrisha, Naidu Sumanth, C. Raghava Prasad, "RFID based student monitoring and attendance tracking system", IEEE- 31661, 4th ICCCNT 2013 July 4-6, 2013, Tiruchengode, India
- [2] SubhadeepDey, Sujit Barman, Ramesh K. Bhukya, Rohan K. Das, "Speech Biometric Based Attendance System", 978-1-4799-2361- 8/14/\$31.00 2014 IEEE
- [3] SitiAisahMohd Noor, NorlizaZaini, MohdFuad Abdul Latip, NabilahHamzah, "Android-based Attendance Management System", 2015 IEEE Conference on Systems, Process and Control (ICSPC 2015), 18 - 20 December 2015, Bandar Sunway, Malaysia
- [4] SanjayBadhe, KunalChaudhari, Sneha Kale, Tejaswi Mane, "Smart Attendance Management System, International Journal of Computer Applications (0975 - 8887) National Conference on Advancements in Computer & Information Technology (NCACIT-2016)