Fingerprint Based Biometric Attendance System

INTRODUCTION

Biometric Attendance systems are commonly used systems to mark the presence in offices and schools. This project has a wide application in school, college, business organisation, offices where marking of attendance is required accurately with time. By using the fingerprint sensor, the system will become more secure for the users. Fingerprint identification is based on the fact that no two persons will have the same fingerprint in this world. This is because of the peculiar genetic code of DNA in each person. Finger print module differentiates between two fingers based on the ridges and valleys on finger print. Main heart of the circuit is the fingerprint module. This sends commands to the controller whenever the fingerprint is matched. Microcontroller receives these commands from the finger print module and uses the internal EEPROM to store the attendance. Keypad is used to send the requests to the controller either to enrol the new one or to save the attendance or to exit.LCD display displays the messages related to the commands received.
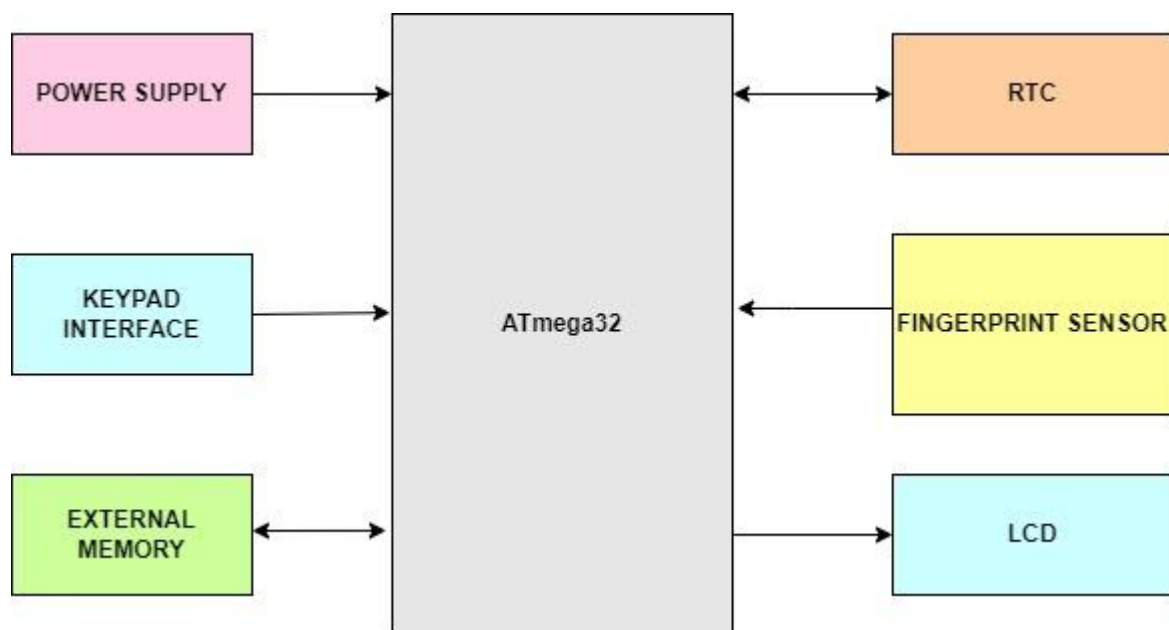
BLOCK DIAGRAM

Figure : Block Diagram for Biometric Attendance system

The whole system is divided into following parts:
- Fingerprint module
- Microcontroller
- Power supply unit
- Keypad Interface
- Real Time Clock
- LCD Display
- External Memory
- Bluetooth Module
- Computer.

1.Fingerprint Module

The Fingerprint module has an inbuilt LED which gives us the indication that the fingerprint module is working or not. It has TTL UART interface for direct connections to microcontroller UART. The module is used for enrolling the fingerprints and also to mark the attendance by doing the same.

2. Microcontroller

Microcontroller used here is P89v51RD2 of the 8051 family which has 64KB Flash and 1024 bytes of data RAM. The key feature of this controller is its X2 mode option. It also has InApplication Programmable. It is a stand alone unit. It is a device which interfaces the whole components of the system onto a single unit.

3. Power Supply Unit

The Power supply unit is built with a combinational circuit including filters, rectifiers, transformer and voltage regulators. The power supply which is designed here is 5V because the controller requires minim 3v supply.

4. Keypad Interface

It is a 4x4 Hex keypad which performs different operations selected by the user. It has 9 numeric buttons, menu option, USB interfacing option, UP, DOWN, BACK and Attendance marking option. The keypad is interfaced with a microcontroller and LCD display.

Real Time Clock

It is interfaced with a microcontroller and works even if the supply is not given. It displays the time and date on the LCD.

LCD Display

The Lcd Display which is used here is 16x2. It displays the information programmed by the user.

External Memory

The external memory is used to store the data of fingerprints. The IC used here is EPROM 24C64 for storing the data. MaxIC is interfaced with PCs via RS232 for serial data communication.

Working of the System

The system will take attendance via the fingerprint module and store the data in a micro-controller and show the number of present students on LCD Display. The system will have admin login for the teacher to select the lecture timing and number. The recorded database of attendance for semester or for a year will be sent to the computer by bluetooth module and it will generate an excel sheet for defaulters.

Advantages

1. Integrated image collecting and algorithm chip together, ALL-in-One.
2. Fingerprint can conduct secondary development & embedded into a variety of end products.
3. Low power consumption, low cost, small size, excellent performance.
4. Professional optical technology, precise module manufacturing techniques.