Design of Multi Level Authentication System For Intruder detection

Dr B.Veera Jyothi, CBIT India.

ABSTRACT

Security is the most important aspect in any part of our lives. A need objective of the utilization of biometrics is to give character confirmation or capacity to precisely perceive people. One major drawback by using biometric fingerprint scanner is silica gel, by using silica gel we can develop latent finger prints on different substrates. This leads us to the next level authentication, by using password. As we know traditional password is a string of characters which is used for user authentication to prove identity. Here again, we can try to attempt to crack password by using brute force attack or dictionary attack To overcome these shortcomings we are enabling third level authentication using OTP. An OTP is a password that is valid for only one login session or transaction. With these three level authentication we have provided a threshold which makes it difficult to illegally access devices.

I. Introduction

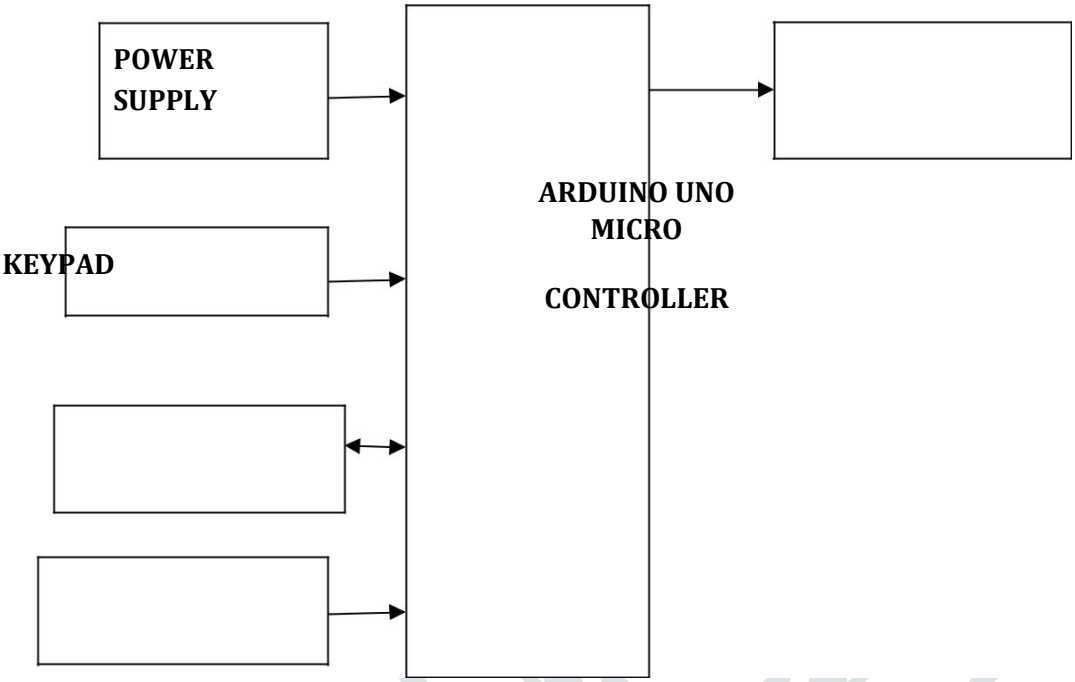
In this present age, safety has becomes an essential issue for most of the people especially in the rural and urban areas. Some people try to cheat or steal the property, which may endanger the safety of money and valuable assets in the bank, house, and office. To overcome the security threat, a most of people will install bunch of locks or alarm system. There are many types of alarm systems available in the market, which utilizes different types of sensor. The sensor can detect different types of changes occur in the surrounding and the changes will be processed to be given out an alert according to the pre-set value. By the same time this system may not be good for all the time. Theft is one of the major problems in schools and offices. To minimize these incidents, different ways to secure belongings and documents were done. Most universities and offices use lockers and cabinets for storing files, securing belongings and keeping of important documents for privacy and security purposes. However, some lockers used ordinary padlocks and were shared by two or more users. Common lockers do not guarantee full safety and security of property because ordinary padlocks can be opened by force In this thesis we have implemented safety of the valuable belongings in the bank locker, house, and office (treasury) by using OTP, Keypad and a fingerprint scanner based multi layered security system.

The word ‘security system’ suggests for itself that it is associated with the safeguard of valuable things. Bangladesh is a developing country with many security problems, which are still to overcome. We are still lacking in technological fields where many nations have already explored. This is happening due to lack of awareness among the people of our nation. The carelessness have got us to this position now from which we are facing trouble to recover ourselves as a nation. But we can all take steps to make our nation a safer place to live in so we need security in every sector of our life. The most important place where safety is required is our households and the place where we store our valuables. The old types of security are no longer strong enough to safeguard such valuables so we must thing digitally and use technology to make security systems much stronger. This types of security may involve using digitals locks, various locks using keypad or word security, using microcontroller, OTP, biometric process, etc.

II. Proposed System

In our proposed system first the user will enrol his user name , password and his mobile number in the system database through system software then the person will put finger on finger print module finger print will be scan and store with finger id . In this way user will enrolment process will be completed .

Then user will perform login operation during login operation user will first enter user name and password if it is correct then finger print will be scan. If fingerprint get matched with pre - stored fingerprint template then OTP will be send on mobile number of the user which entered during enrolment through GSM .Then user will punch the code through keypad if the code get match then led will be blink or lockers will be open . And message will be sent to registered mobile number as access granted.



1: Block diagram of the proposed system

BLOCK DIAGRAM DESCRIPTION

Power Supply: This section is meant for supplying Power to all the sections mentioned above. It basically consists of a Transformer to step down the 230V ac to 9V ac followed by diodes. Here diodes are used to rectify the ac to dc. After rectification the obtained rippled dc is filtered using a capacitor Filter. A positive voltage regulator is used to regulate the obtained dc voltage.

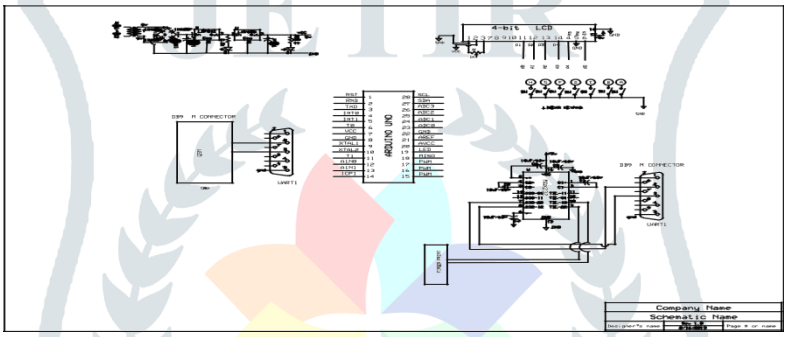
Microcontroller: This section forms the control unit of the whole project. This section basically consists of a Microcontroller with its associated circuitry like Crystal with capacitors, Reset circuitry, Pull up resistors (if needed) and so on. The Microcontroller forms the heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.

LCD Display: This section is basically meant to show up the status of the project. This project makes use of Liquid Crystal Display to display / prompt for necessary information.

GSM modem Section: This section consists of a GSM modem. The modem will communicate with microcontroller using serial communication. The modem is interfaced to microcontroller using MAX 232, a serial driver. The Global System for Mobile Communications is a TDMA based digital wireless network technology that is used for communication between the cellular devices. GSM phones make use of a SIM card to identify the user's account.

Finger Print Recognition: Finger print recognition will be done in module i.e. in module users finger print images are enrolled and even unnecessary finger prints can be deleted also so it has more accessibility in adding new users also.

Keypad: In electronics, a switch is an electrical component that can break an electrical circuit, interrupting the current or diverting it from one conductor to another. The most familiar form of switch is a manually operated electromechanical device with one or more sets of electrical contacts. Each set of contacts can be in one of two states: either 'closed' meaning the contacts are touching and electricity can flow between them, or 'open', meaning the contacts are separated and non-conducting.



2: Schematic Diagram

SCHEMATIC EXPLANATION:

In this project we required operating voltage for ARDUINO controller board is 5V. Hence the 5V D.C. power supply is needed for the ARDUINO board.

This regulated 5V is generated by stepping down the voltage from 230V to 18V now the step downed a.c voltage is being rectified by the Bridge Rectifier using 1N4007 diodes. The rectified a.c voltage is now filtered using a ‘C’ filter. Now the rectified, filtered D.C. voltage is fed to the Voltage Regulator.

This voltage regulator provides/allows us to have a Regulated constant Voltage which is of +12V.

The rectified; filtered and regulated voltage is again filtered for ripples using an electrolytic capacitor 100µF. Now the output from this section is fed to microcontroller board to supply operating voltage. .

LCD are connected to 2,3,4,5,6,7 pins

Finger print module is connected to 1 pin

3 HARDWARE COMPONENTS

Microcontroller (ATMEGA328P):

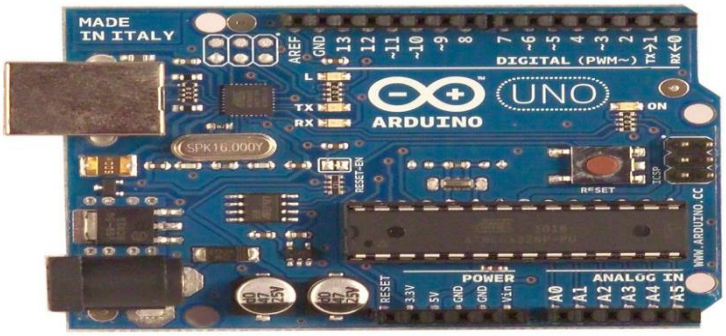


Fig.3: Micro controller ATMEGA328P

Overview:

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Power Supply

The power supply is designed to convert high voltage AC mains electricity to a suitable low voltage supply for electronic circuits and other devices. A power supply can by broken down into a series of blocks, each of which performs a particular function.

A D.C. power supply which maintains the output voltage constant irrespective of a.c mains fluctuations or load variations is known as “Regulated D.C Power Supply”. For example a 5V regulated power supply system as shown below in Fig 3.5:

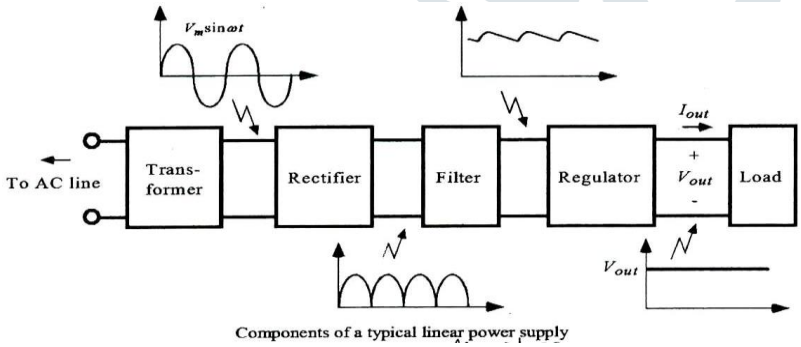


Fig.5: Functional block diagram of power supply

Transformer:

A transformer is an electrical device which is used to convert electrical power from one electrical circuit to another without change in frequency. Transformers convert AC electricity from one voltage to another with little loss of power. Transformers work only with AC and this is one of the reasons why mains electricity is AC. Step-up transformers increase in output voltage, step-down transformers decrease in output voltage.

Fig **6: An electrical transformer**

Liquid crystal display

Liquid crystal displays (LCDs) have materials, which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal.

GSM modem:

This is a GSM/GPRS-like minded quad-band cell telephone, which fits on a frequency of 850/900/1800/1900mhz and which may be used now not Simplest to access the net, but additionally for oral conversation (furnished that it's far connected to a USB microphone and a small loud speaker) and for SMS.

LINEAR KEYPAD

This section basically consists of a Linear Keypad. Basically a Keypad can be classified into 2 categories. One is Linear Keypad and the other is Matrix keypad.

1. Matrix Keypad.

Linear Keypad

FINGER PRINT SCANNER

NITGEN FIM 3030:

A fingerprint sensor is an electronic device used to capture a digital image of the fingerprint pattern. The captured image is called a live scan. This live scan is digitally processed to create a biometric template (a collection of extracted features) which is stored and used for matching.

Fingerprint Patterns

1. Loops
    a. Ridge lines enter from one side and curve around to exit from the same side
    b. 60-65% of population
2. Whorls
    a. Rounded or circular ridge pattern
    b. 30-35% of population
3. Arches
    a. Ridge lines enter from one side of print and exit out the other
    b. 5% of population

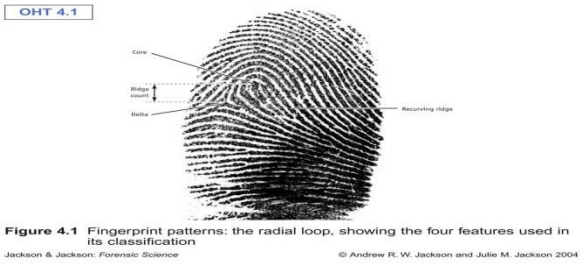


Fig.7: Finger print patterns