

**A Thesis/Project/Dissertation Report**

on

**Biometric ATM System**

*Submitted in partial fulfillment of the  
requirement for the award of the degree of*

**Bachelor Of Technology**



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**SCHOOL OF COMPUTING SCIENCE AND  
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I/We hereby certify that the work which is being presented in the thesis/project/dissertation, entitled “CAPS...” in partial fulfillment of the requirements for the award of the Bachelor Of Technology submitted in the School of Computing Science and Engineering of Galgotias University, Greater Noida, is an original work carried out during the period of month, Year to Month and Year, under the supervision of Name... Designation, Department of Computer Science and Engineering/Computer Application and Information and Science, of School of Computing Science and Engineering , Galgotias University, Greater Noida

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The Final Thesis/Project/ Dissertation Viva-Voce examination of Sugam Sinha has been held on \_\_\_\_\_ and his/her work is recommended for the award of Bachelor Of Technology-

**Signature of Examiner(s)**

**Signature of Supervisor(s)**

**Signature of Project Coordinator**

**Signature of Dean**

Date: November, 2013

Place: Greater Noida

# FINGERPRINT BASED ATM SYSTEM

## Project Report

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### ABSTRACT

**Identification and verification of a person today is a common thing; which may include door-lock system, safe box and vehicle control or even at accessing bank accounts via ATM, etc which is necessary for securing personal information. The conventional methods like ID card verification or signature does not provide perfection and reliability. The systems employed at these places must be fast enough and robust too. Use of the ATM (Automatic Teller Machine) which provides customers with the convenient banknote trading is facing a new challenge to carry on the valid identity to the customer. Since, in conventional identification methods with ATM, criminal cases are increasing making financial losses to customers.**

**Keywords- Fingerprint sensor (FIM3030), Microcontroller (Atmega328)**

### INTRODUCTION

In today's modern world, autonomous systems play an important role in our day to day life. As the social computerization and automation have drastically increased, it can be seen evidently where the number of ATM centers increases rapidly. Most civilians use ATM's regularly. A good example can be a financial transaction, ease of money exchange etc. So there exists an important factor called security. The crime rates involved in financial organizations have increased tremendously. Over past few years "90 % of crimes in ATM centers in the form of robbery". This issue poses a serious threat to both bank management and civilians. Therefore this study proposes a solution to minimize the ATM robbery in real time by means of embedded systems and GSM technology. The main motive of this design is to prevent ATM theft. Many real time incidents around us has been the main motivation of this project.

### STUDY OF EXISTING SYSTEM

We are using ATM's in our country for all our banking activities. An automated teller machine (ATM) is an electronic telecommunications device that enables customers of financial institutions to perform financial transactions, such as cash withdrawals, deposits, transfer funds, or obtaining account information, at any time and without the need for direct interaction with bank staff.

On most modern ATMs, customers are identified by inserting a plastic ATM card (or some other acceptable payment card) into the ATM, with authentication being by the customer entering a personal identification number (PIN), which must match the PIN stored in the chip on the card (if the card is so equipped), or in the issuing financial institution's database.

Using an ATM, customers can access their bank deposit or credit accounts in order to make a variety of financial transactions such as cash withdrawals, check balances, or credit mobile phones. ATMs can be used to withdraw cash in a foreign country. If the currency being withdrawn from the ATM is different from that in which the bank account is denominated, the money will be converted at the financial institution's exchange rate.

### **LIMITATIONS OF EXISTING SYSTEM**

- If problem with credit card you cannot withdraw your money.
- If someone watches or hacks an ATM machine your details may be taken if you forget your PIN number you cannot use the card.
- Cannot be provided in rural areas: In a country like India, where banks are having large number of rural and non-computerized branches, ATM services cannot be provided.
- Limitation of cash withdrawals: Again there is a limitation of cash withdrawals from ATM. For example, many banks do not permit withdrawal of more than 25,000 at a time.
- Cash deposit facility is not safe: Similarly cash deposit facility is restricted and not safe as dropping of envelope and ATM is not advisable.
- Possibility of misusing ATM card: ATM card, if misplaced, lost or stolen, may be misused. There are number of such reported incidences now a day.
- Loss of personal touch with the Banks: Last but not the least; customers lose personal touch with their bankers.

### **PROPOSED SYSTEM**

We are using ATM's in our country for all our banking activities. An automated teller machine (ATM) is an electronic telecommunications device that enables customers of financial institutions to perform financial transactions, such as cash withdrawals, deposits, transfer funds or obtaining account information, at any time and without the need for direct interaction with bank staff.

In our proposed system we are introducing finger print sensor in which when a user scan their finger, if that user is valid then the door opens and name is displayed on the LCD monitor, after transaction activity the door will close within 10 second. In case if there is any fraud activity happens inside ATM then the buzzer and the LED light becomes on and message pass to bank and nearest police station. Also in bank there is a theft detection system, in that system before the bank closes an image of strong room is captured which will set as master picture then the system continuously captures the image of the strong room before the bank opens. If anyone of the image has any change other than master picture, then that particular image will be stored in the database otherwise it will be deleted. When there occurs any high mismatch between the pictures then an alert message will be send to bank.

### **ADVANTAGES OF PROPOSED SYSTEM**

- IOT ATM is highly secured system
- It provides a finger print sensor on the door
- It only allow entry for the valid persons
- The ATM machine is secured with vibration sensor
- If there any malpractice occur on machine, full system become locked
- An alert message is passed to the bank
- Detect theft by image comparison process done by the software

## **FEASIBILITY STUDY**

Feasibility Analysis involves eight steps:

1. Form a project team and appoint a project leader.
2. Prepare a system flow chart.
3. Enumerate potential candidate systems.
4. Describe and identify characteristics of candidate systems.
5. Describe and evaluate performance and cost effectiveness of each candidate systems.
6. Weight system performance and cost data.
7. Select the best candidate system.
8. Prepare and report final project directive and management.

The Aspects of feasibility includes:

1. Technical Feasibility study
2. Operational Feasibility study
3. Financial And Economic Feasibility study
4. Behavioral Feasibility

### **Technical Feasibility**

The main objective of feasibility study is to test the technical, social and economic feasibility of developing a system. Investing the existing system in the area under investigation and generating ideas about the new system does this. Feasibility study has been done to gather required information. Training, experience and common sense are required for collection of the information. Data was gathered and checked for completeness and accuracy. Analyzing the data involved identification of the components of the system and their interrelationship and identified the strength and weakness of the system.

## **FUNCTIONAL REQUIREMENTS**

### **SOFTWARE REQUIREMENTS**

Language	:	PHP
IDE	:	Dreamweaver
Frontend	:	PHP 5.5
Backend	:	My SQL
Web Server	:	Apache
Web Browser	:	IE/Chrome/Safari/Opera
Operating System	:	Windows 7 or Higher

### **HARDWARE REQUIREMENTS**

Display	:	LCD 18", 1024x768 / Above
Internet connection	:	512 kbps or above
Microcontroller	:	Atmega328
Microprocessor	:	Arduino UNO
Sensors	:	Ultrasonic sensor
Communication hardware	:	Wi-Fi-modem
Dustbin	:	Trash can with a lid
Mobile phone	:	Smart phone with Internet connection

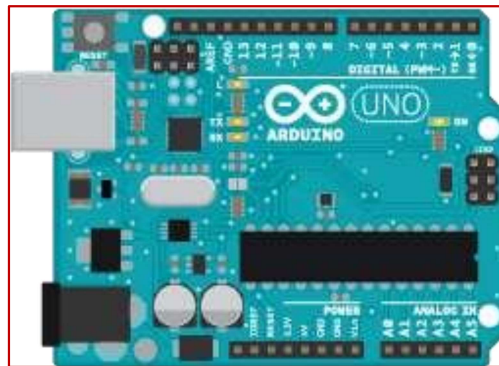
## ARDUINO MEGA

The Arduino Mega is a microcontroller board based on ATmega1280 (datasheet). It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, 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. The Mega is compatible with most shields designed for the Arduino Duemilanove or Diecimila.

## PLATFORM - ARDUINO OPEN SOURCE

In general, open source refers to any program whose source code is made available for use or modification as users or other developers see fit. Open source software is usually developed as a public collaboration and made freely available.

## ARDUINO



Arduino is a software company, project, and user community that designs and manufactures computer open-source hardware, open-source software, and microcontroller-based kits for building digital devices and interactive objects that can sense and control physical devices. Arduino is an open-source prototyping platform based on easy-to-use hardware and software.

### Atmega2560

The high-performance, low-power Microchip 8-bit AVR RISC-based microcontroller combines 256KB ISP flash memory, 8KB SRAM, 4KB EEPROM, 86 general purpose I/O lines, 32 general purpose working registers, real time counter, six flexible timer/counters with compare modes, PWM, 4 USARTs, byte oriented 2-wire serial interface, 16-channel 10-bit A/D converter, and a JTAG interface for on-chip debugging. The device achieves a throughput of 16 MIPS at 16 MHz and operates between 4.5-5.5 volts.

By executing powerful instructions in a single clock cycle, the device achieves a throughput approaching 1 MIPS per MHz, balancing power consumption and processing speed.

Parameter Name	Value
Program Memory Type	Flash
Program Memory Size (KB)	256
CPU Speed (MIPS/DMIPS)	16
SRAM Bytes	8,192
Data EEPROM/HEF (bytes)	4096
Digital Communication Peripherals	4-UART, 5-SPI, 1-I2C
Capture/Compare/PWM Peripherals	4 Input Capture, 4 CCP, 16PWM
Timers	2 x 8-bit, 4 x 16-bit
Number of Comparators	1
Temperature Range (C)	-40 to 85
Operating Voltage Range (V)	1.8 to 5.5
Pin Count	100

### Diode:

In electronics, a diode is a two-terminal electronic component that conducts primarily in one direction (asymmetric conductance); it has low (ideally zero) resistance to the flow of current in one direction, and high (ideally infinite) resistance in the other. A semiconductor diode, the most common type today, is a crystalline piece of semiconductor material with a p–n junction connected to two electrical terminals.

Today, most diodes are made of silicon, but other semiconductors such as selenium or germanium are sometimes used.

### Finger print sensor (R305)

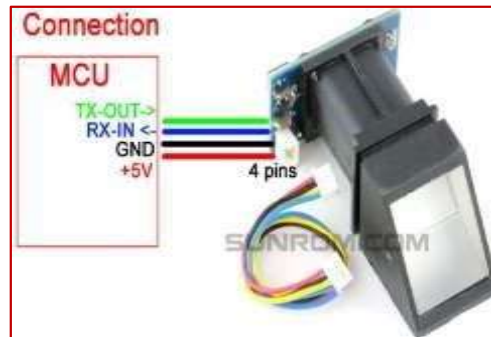


This is a finger print sensor module with TTL UART interface for direct connections to microcontroller UART or to PC through MAX232 / USB-Serial adapter. The user can store the finger print data in the module and can configure it in 1:1 or 1: N mode for identifying the person. The FP module can directly interface with 3v3 or 5v Microcontroller. A level converter (like MAX232) is required for interfacing with PC serial port. Optical biometric fingerprint reader with great features and can be embedded into a variety of end products, such as: access control, attendance, safety deposit box, car door locks



## Connection of fingerprint to Microcontrollers

The fingerprint sensor can be wired as below. Do not follow color code of connector provided. The corner pin is +5V as shown below in red line, then is Ground(GND), Then TXD which goes to MCU's RX-IN, and last pin is RXD which goes to MCU's TX-OUT pin.



## LCD 16x2



## Piezo buzzer

A piezoelectric element may be driven by an oscillating electronic circuit or other audio signal source, driven with a piezoelectric audio amplifier. Sounds commonly used to indicate that a button has been pressed are a click, a ring or a beep.

## Regulator

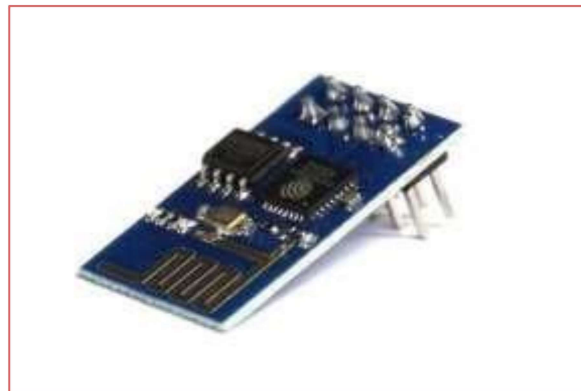
A voltage regulator is designed to automatically maintain a constant voltage level. A voltage regulator may be a simple "feed-forward" design or may include negative feedback control loops. It may use an electromechanical mechanism, or electronic components. Depending on the design, it may be used to regulate one or more AC or DC voltages.

## Relay driver module



A relay is an electrically operated device. It has a control system and (also called input circuit or input contactor) and controlled system (also called output circuit or output contactor). It is frequently used in automatic control circuit. To put it simply, it is an automatic switch to controlling a high-current circuit with a low-current signal.

## Wi-Fi module



Wi-Fi or Wi-Fi is a technology for wireless local area networking with devices. Wi-Fi most commonly uses the 2.4 gigahertz (12 cm) UHF and 5.8 gigahertz (5 cm) SHF ISM radio bands. Anyone within range with a wireless modem can attempt to access the network; because of this, Wi-Fi is more vulnerable to attack (called eavesdropping) than wired networks. Wi-Fi Protected Access is a family of technologies created to protect information moving across Wi-Fi networks and includes solutions for personal and enterprise networks. Security features of Wi-Fi Protected Access constantly evolve to include stronger protections and new security practices as the security landscape changes.

## SYSTEM IMPLEMENTATION

Implementation is the process of bringing developed system into operational use and turning it over to the user. This is the most crucial stage in the life cycle of a project. The project may be accepted or rejected

depending on how it gathers confidence among the users. If the users have achieved satisfaction with the new project, then the project can be termed as successful and then onwards its maintenance and other subsequent work can be commenced.

An implementation plan is necessary, its major elements are

- Training plans
- Equivalent installation plans
- Conversion plans

Training plan is necessary to ensure that all persons who are associated with the system have the necessary knowledge skills. Equipment implementation is an activity that is completed during the development phase. The equipment related activities are site operation, equipment installation and hardware and software checkout. Conversion is the process of initiating all of the physical operations that results directly in the turn over of the new system to the user.

## **SYSTEM MAINTENANCE**

Maintenance is any work done to change the system after it is in operational. The maintenance phase of the software life cycle is the time period in which a software product performs useful work. In this we retrieve the data from the database design by searching the database. So, for maintaining data our project has a backup facility so that there is an additional copy of data, which needs to be maintained. They may define Software Maintenance by describing four activities that are undertaken after a program is released for use.

## **FUTURE ENHANCEMENT**

This is the embedded plus DIP based so we can make our own algorithm in micro controller for more security concern. We can use these high level security transfer system for banking, military and online shopping. We can use the powerful antennas for longer communication.

## **CONCLUSION**

As we all know, these days most of the ATM has been attacked by the robberies. Also gradual increases the theft of ATM after the year by year. This paper demonstrates how an automation of "ATM THEFT" prevention from robbery.

In today's modern world, autonomous systems play an important role in our day to day life. As the social computerization and automation have drastically increased, it can be seen evidently where the number of ATM centers increases rapidly. Most civilians use ATM's regularly. A good example can be a financial transaction, ease of money exchange etc. So there exists an important factor called security. The crime rates involved in financial organizations have increased tremendously. Over past few years – "90 % of crimes in ATM centers in the form of robbery". This issue poses a serious threat to both bank management and civilians. Therefore this study proposes a solution to minimize the ATM robbery in real time by means of embedded systems and GSM technology. The main motive of this design is to prevent ATM theft. Many real time incidents around us has been the main motivation of this project.

## **BIBLIOGRAPHY**

1. Steven Holzner, "php complete reference", First Edition 2007.
2. Timconverse, joyce park. "PHP and MYSQL Bible", First Edition 2004.
3. Neilsmyth/payload media", PHP Essentials", First Edition 2009.
4. Roggers.pressman. "software engineering", First Edition 1982.
5. Simon, Collision, "css Mastery", First Edition 2009.

**Websites**

- <http://www.php.net>
- <http://www.sql.com>
- <http://www.w3schools.com>
- [http://developer.mozilla.org\](http://developer.mozilla.org)