

Design and Implementation of a Security-Based System for ATM

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ABSTRACT: The Idea of Designing and Implementation of a Security-Based ATM theft project is born with the observation in our real-life incidents happening around us. This project deals with the prevention of ATM theft from robbery, so overcome the drawback found in existing technology in our society. Whenever a robbery occurs, the Vibration sensor is used here which senses vibration produced from the ATM machine. This system uses an ARM controller based embedded system to process real-time data collected using the vibration sensor. Once the vibration is sensed the beep sound will occur from the buzzer. DC Motor is used for closing the door of the ATM. Stepper motor is used to leak the gas inside the ATM to bring the thief into the unconscious stage. The camera is always in processing and sending video continuously to the PC and it will be saved on the computer. RTC used to capture the robber occur time and send the robbery to occur time with the message to the nearby police station and corresponding bank through the GSM. Hear LCD display board using showing the output of the message continuously. This will prevent the robbery and the person involving in robbery can be easily caught.

KEYWORDS: ATM, fingerprint, GSM modem, Accelerometer, DC motor, Authentication.

I. INTRODUCTION

In day today life there is no proper security for ATM. Robbery is becoming more serious problem. So to overcome these problem mainly two techniques has been used such as non-biometric and biometric. In non-biometric technique personal ID and OTP are used for authentication purpose but it can be hacking easily so biometric technique is preferred over non-biometric technique. In biometric technique fingerprint recognition, retinal recognition, face recognition etc. methods are used, but face recognition, retinal recognition technique are very costly so we are preferring fingerprint recognition with the vibration sensor. Vibration sensor is a special type of sensor which is used to detect movement of ATM machine. This system uses ARM controller for processing the data. ARM controller takes the action according to the signal comes from Accelerometer. ARM11 provide signal to DC motor drive to drive both two DC motor for door locking and gas spraying purpose. It also gives signal to GSM modem by which message is send to bank manager and nearest police station. Once the movement is detected the 'beep' sound will occurs from buzzer.

II. RELATED WORK

A. The paper deals with avoiding robbery of ATM machine. Whenever robbery occurs vibration sensor is used to detect the movement of ATM machine. Vibration sensor is gives the signal to ADC. Micro-controller used to the processing data and GSM modem send the message nearby police station [1].

B. The paper deals with avoiding robbery using vibration sensor and caught the theft inside ATM center using DC motor. Vibration sensor is used to sense the movement and gives the signal to ARM. ARM takes controlling action according to input signal. If signal is more than the set value then DC motor activate to lock the door and stepper motor is used for leak the gas inside the ATM center [2].

C. The paper deals with prevention of ATM theft using Raspberry Pi with PIC micro-controller. Vibration sensor is used for sensing vibration of ATM. If value is greater than the set value then DC motor activates to close the door. The camera module is used to acquire the image of user [3].

III. BLOCK DIAGRAM

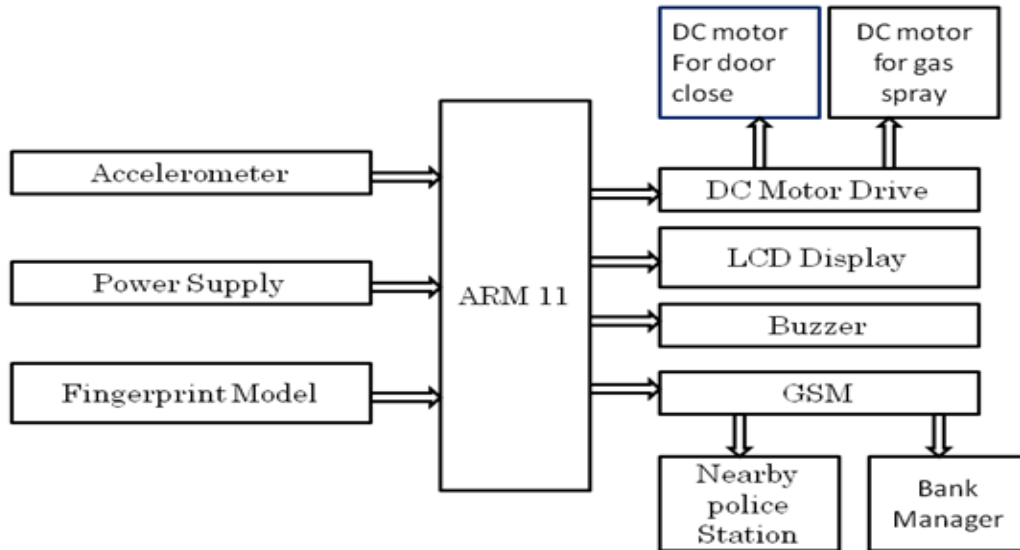


Fig.1 :Block Diagram

ARM11:ARM11 controller is 32 bit RISC machine used for controlling action, for consumer, home and embedded application. It operates on low power ARM11 is compatible with all previous with all previous ARM family.Cortex M3 based micro controller for high level of integration and low power consumption. It uses Harvard architecture with separate instruction and data bus. It uses DMA controller, 4 UART’S, 2 CAN, 2 SSP controller, SPI interface, 3 I2C bus interfaces, 12 bit ADC, 10 bit DAC.

Accelerometer:Accelerometer is one type of vibration sensor. It is electro-mechanical device that is used for detect the movement of ATM. It uses piezoelectric effect in which micro controller crystal structure is used to generate the voltage. Accelerometer detect the movement across two axis x and y.

Buzzer:Buzzer is a device that is used for generating of sound signal in emergency situation for gathering attention. When buzzer is activating it produces long beep sound for security purpose.

GSM Modem:GSM is same as mobile phone which is use for sending message to required authority as per application. GSM uses SIM card and it is send SMS as well as MSM. It used for TDMA. It totally wireless system.

Dc Motor Drive & DC Motor:Dc motor drive is electrical device used for proper operation of DC motor. DC motor is used for door lock and leakage of gas. When movement is detected DC motor will activated to lock the door & spray the gas in ATM center.

Fingerprint Model:Finger recognition is used for authentication purpose. It matches the real time fingerprint with the database store in memory. If match will be found door will be open otherwise not. Fingerprint recognition or fingerprint authentication refers to the automated method of verifying a match between two human fingerprints.

LCD (Liquid Crystal Display):It uses the 16*2 that is 16 characters in one line, total two line are there. It is used to display the data. It is 14 pin IC and it can display the character by using ASCII values. It can operate on 5V.

IV. FLOW DIAGRAM

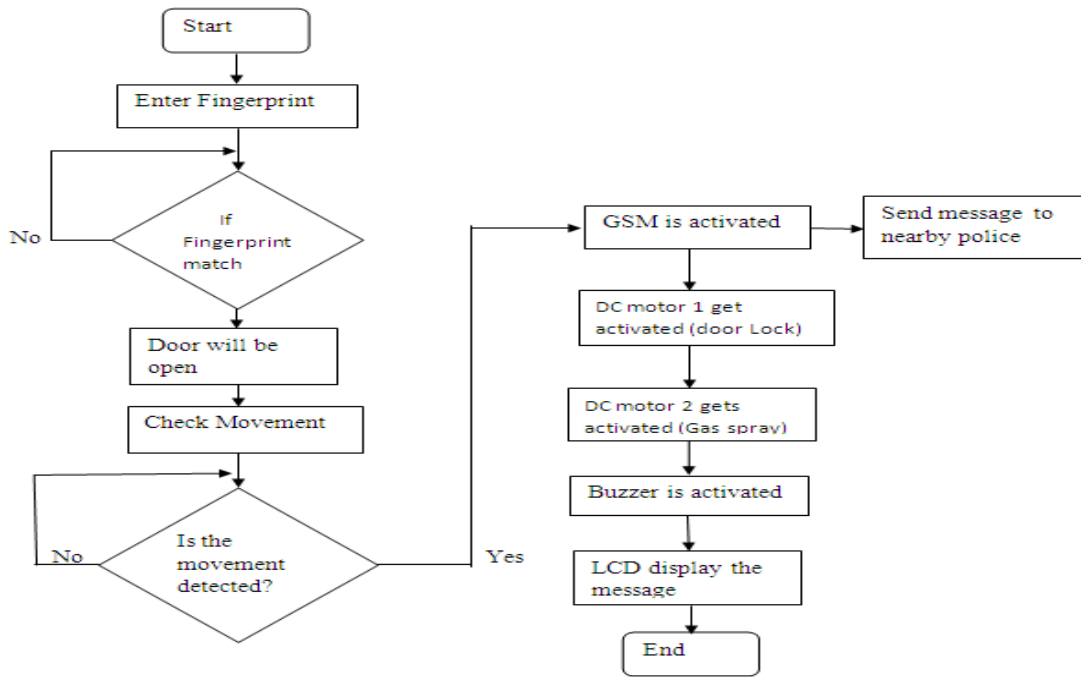


Fig. 2 Flow Chart

V. RESULT

Users	Fingerprint match	Movement Detected	Action
User 1	No	-	Lock Door
User 2	Yes	No	Normal User Unlock Door
User 3	Yes	Yes	Theft Detected Lock door, Send SMS, Activate buzzer and Spry gas in ATM center

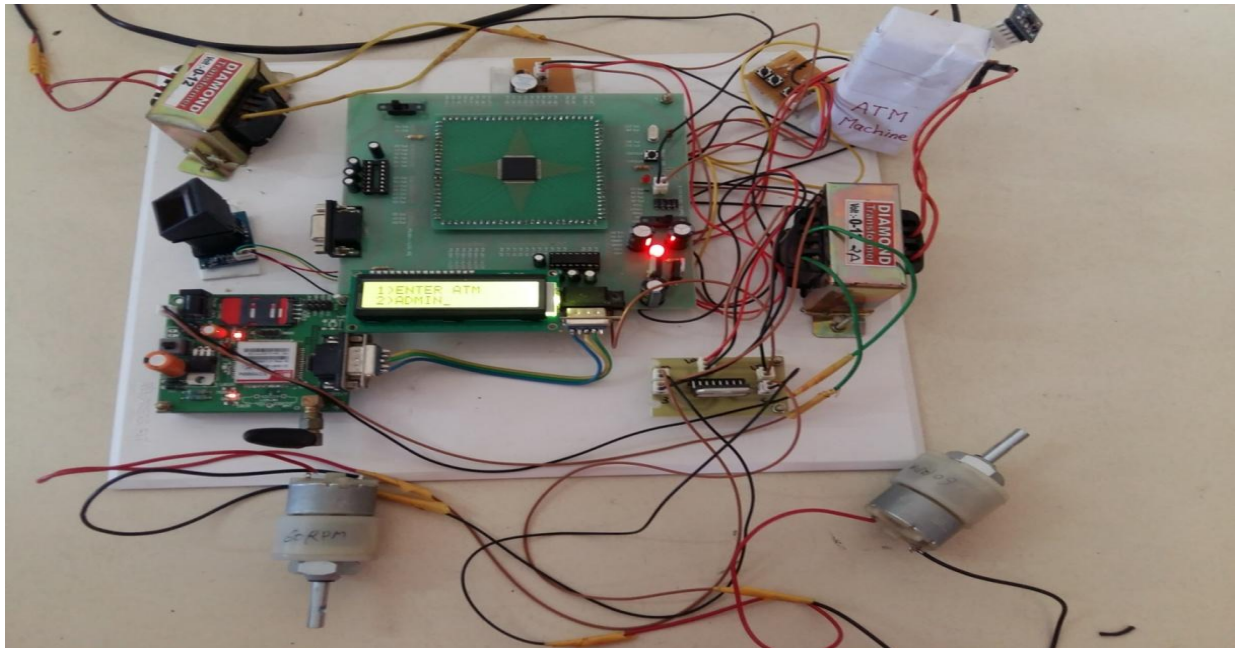


Fig 5.1: Picture of Anti-theft ATM Machine

VI. FUTURE SCOPE

Fingerprint models internal memory is not sufficient for large no of user data so it can be expanded by using external memory. Retinal recognition can be used for authentication to increase security of ATM machine. As the storage space is also less in future we can also record these live streaming data by connecting external memory storage. We can complete our project using wireless technology. In future we can provide more security to data by using encryption, decryption techniques.

VII. CONCLUSION

By using this ATM security system, robberies of ATM machine can overcome, the theft can be caught easily with the development of sensor technology, vibration sensors in the form will be varied, through the extensive application of electronic technology to achieve high overall performance further of electronic technology to achieve high overall performance further. Thus our project provides efficient access to reduce theft environment. ATM room will be more secure. Theft can be caught in ATM center and robbery is reduced. It is a fully automated system so no manual security required for each proper authentication is implemented so nobody misuses the ATM. Thus our project provides efficient access to reduce theft environment. ATM room will be more secure.

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