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Smart Security System In Automatic Teller Machine

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ABSTRACT
This research paper is based on the concept of smart security system in automatic teller machine by using face recognition, finger print scanner and ATM access card method. In this paper security approaches of ATM have been focused and have been improved using bio metric based authentication technique. Vibration sensor is used here which senses vibration produced from ATM machine. ATM access card stores the finger print and face of the human. This card is used to open the door. This system based on embedded system to process real time data collected using the vibration sensor. A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. Stepper motor is used to leak the anesthesia gas inside the ATM to bring the thief into unconscious stage.
Keywords **–**GSM, ATM, Vibration sensor and modem.

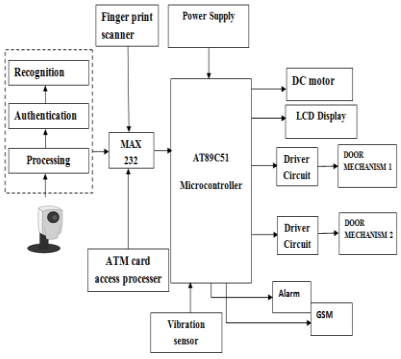
I. INTRODUCTION

In this proposed project various features were added like image processing, GSM, vibration sensor, door locking mechanism and access card method. The ATM access card is given by the bank itself. The person who knowing to access the ATM means they can get the ATM access card from the bank. At that time bank record the face of the candidate and finger print. If the person wants to withdraw the money means the person should insert the ATM access card into the ATM access card processor. Then the face of the human is captured by using web camera and then the person should register the finger print into the finger print scanner.

The microcontroller compares the recorded face and finger print with the captured face and finger print. If the recorded details and the captured details of the candidate matched means the door will be open otherwise the door will remains closed. The ATM door will be opened while the person face is completely scanned and recognized. If any one of the people covers his/her face using mask, helmet or any other else the door will not open. If the person breaks the camera and trying to enter into the glass door by breaking the glass, automatic steel door will operate inside the ATM center and also if the person tries to steal the amount by breaking the ATM machine, the vibration sensor will operate and the anesthesia in the corner of the room will be spread.

At once the person inhales the anesthesia, he will faint. Simultaneously the information will be send to the police station and as well as the respective bank by using zigbee and GSM technology. Incase if the person covers his face while the anesthesia is spreading inside the room, at that time he can't to come out because the automatic steel door will be locked. So the criminal cannot escape from the ATM center. There is a chance of spreading anesthesia, when the ATM machine vibrates due to any earthquake or natural disaster. In order to prevent that, we are using additional vibration sensor under the ATM machine at a certain distance. If both vibration sensors vibrate at the same time, the anesthesia will not spread out. Once the person tries to steal the amount from the ATM, he/she will be definitely caught by any one of these features. Through this we can control 100% ATM theft and the criminal can be easily caught red-handed and there is no need of any security to prevent the ATM center. In future we are going to implement this project wherever we need security like bank, home etc.

Figures And Tables



(Fig1 Smart security system in ATM)

II. DESCRIPTION

2.1 Fingerprint recognition

Fingerprint recognition or fingerprint authentication refers to the automated method of verifying a match between two human fingerprints. Fingerprints are one of many forms of biometrics used to identify individuals and verify their identity. This article touches on two major classes of algorithms (minutia and pattern) and four sensor designs (optical, ultrasonic, passive capacitance, and active capacitance).

2.2 Microcontroller Unit

AT89C51

The microcontroller used in this project is the AT89C51 microcontroller which is used to transfer the signals regarding the bus through the Zigbee transceiver continuously. The LCD is interfaced with the microcontroller for knowing the operations regarding the project.

2.3 ARM LPC2129 Microcontroller

ARM Microcontroller is used to receive the bus signals in the nearby area by using the Zigbee technology. All the bus details from all the bus stop sections are transferred to the control section through the GPRS modem which will be uploaded into the internet.

2.4 Communication unit

GPRS Modem

The GPRS Modem is used continuously used to transmit the data from the microcontroller to the control section regarding the buses near the bus stops.

2.5. Power supply unit

The supply of 5V DC is given to the system which is converted from 230V AC supply. Firstly, the step down transformer will be used here for converting the 230V AC into 12V AC. The microcontroller will support only the DC supply, so the AC supply will be converted into DC using the bridge rectifier. The output of the rectifier will have ripples so we are using the 2200uf capacitor for filtering those ripples. The output from the filter is given to the 7805 voltage regulator which will convert the 12V DC into 5V DC. The output from the regulator will be filtered using the 1000uf capacitor, so the pure 5V DC is getting as the output from the power supply unit. Here we are using the PIC microcontroller which will be capable of getting the supply of 5V DC so we have to convert the 230V AC supply into 5V DC supply.

3.6. Zigbee

The Zigbee is the technology which is used to carry less data rates but it will transfer the data to very long distances. The Zigbee will receive the data from the microcontroller and will send to the control section. In the control section the Zigbee technology is used to send the commands from the user to the microcontroller.These microcontrollers combine a microprocessor unit (like the CPU in a desktop PC) with some additional circuits called "peripherals", plus some additional circuits on the same chip to make a small control module requiring few other external devices. This single device can then be embedded into other electronic and mechanical devices for low-cost digital control.

2.7. Display Unit

LCD

A liquid crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals (LCs). LCDs do not emit light directly. The main use of this is to view the operation going on inside the robot.

3.8. Vibration sensor

This sensor buffers a piezoelectric transducer. As the transducer is displaced from the mechanical neutral axis, bending creates strain within the piezoelectric element and generates voltages. The Zigbee will receive the data from the microcontroller and will send to the control section. In the control section the Zigbee technology is used to send the commands from the user to the microcontroller.

3.9. Embedded System

An embedded system is typically a design making device will behave as a form of vibration sensor. The sensing element should not be treated as a flexible switch, and is not intended to be bent. In this system we will be using a vibrating sensor (piezoelectric transducer) to find vibration from ATM machine whenever robbery occurs.

III. CONCLUSION

As we all know thus the most of the ATM has been attacked by the robberies. Biometric authentication with smart card is a stronger method of authentication and verification as it is uniquely bounded to individuals by using this smart security system in automatic teller machine, robberies of ATM can overcome. The thief can be caught easily. The whole system is built on the technology of embedded system which makes the system more safe reliable and easy to use.

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