

# Exam Control Room Smart Security System

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## ABSTRACT

In this paper, Exam control room security system has been proposed that has a special feature and which make a dial with the principal & authority persons of University to inform him that Exam control room has been hacked by using GSM. Arduino card was used which is considered one of the modern programmable devices and utilize to control all security system. Unauthorized access is prohibited by designing a lock that stores the fingerprints of one or more authorized users. Fingerprint is sensed by sensor and is validated for authentication. If the fingerprint matches, the door will be opened automatically otherwise the system captures the image of unauthorized person. PIR detector is used to unauthorized persons detection after lock. Magnetic door sensor used to detect the door is open or closed and microcontroller saves the data log of that. IR pair used to count number of persons in the room.

**Keywords:** Fingerprint, GSM, IR pair, PIR.

## I. INTRODUCTION

Today colleges and university are facing more problems about security of question paper and answer sheets. There are lots of solutions available for other security issue and solution for this problem is not yet discovered. Arduino card was used, which is considered one of the modern programmable devices and utilize to control all security system the door will be opened automatically otherwise the system unauthorized person access is prohibited by designing a lock that stores the fingerprints of one or more authorize users. Otherwise provide control room alarm system or text message system give message to authorized person. Magnetic door sensor also used to sense door is open or closed. fingerprint scanner scan the authorized person thumb and the any one person try to open exam control room door then system activated and buzzer is on continuously sends the text message to authorized person. In this system provide also 4\*4 matrix keypad this is password system by

used authorized person. This is alternative to fingerprint sensor. Door lock mechanism is connected to main door of the exam control room in colleges.

## II. PROPOSED SYSTEM

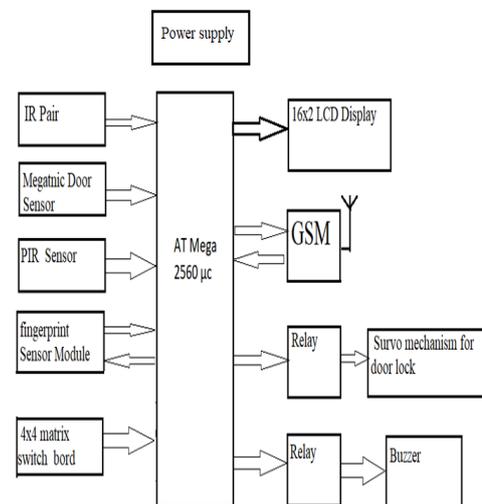


Figure 1. Block diagram of system.

System Description -

Our proposed system overcomes all the security problems in existing system and provides high security and efficiency for exam control room. This system enriched the level of security. Access is granted only for the user whose code matches with fingerprint with the authorized code. Fingerprint is a boon solution for these problems which provides high level of recognition accuracy. 4\*4 matrix switch board for high security. If this three system matches then the servo mechanism door lock will open from inside and IR pair will count the persons getting in the room and magnetic switch will become deactivated. Then the microcontroller will send the message through GSM to the head of the exam control or the principal of the college. But if any one breaks the any one from security checkpoint then the message will be sent to the principal and head also buzzer will be on.

### III. HARDWARE REQUIREMENT

#### 3.1 Arduino (AT Mega 2560):

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560 (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.

#### 3.2 IR Pair

An IR sensor is basically a device which consists of a pair of an IR LED and a photodiode which are collectively called a photo-coupler or an opto coupler. The IR LED emit IR radiation reception and/or intensity of reception of which by the photodiode indicates output of the sensor.

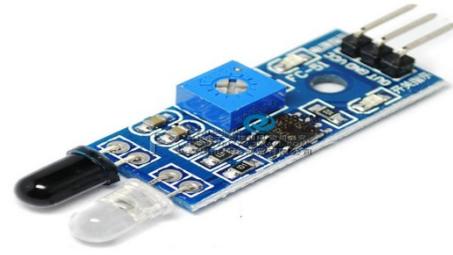


Figure 2. IR pair sensor

#### 3.3 Magnetic Door Sensor:

These sensor are attached to the door of exam control room they will get activated a burglar tries to open any one door .the alarm will be set on and message will be sent to authorized person of exam control room.

#### 3.4 PIR Sensor:

A PIR-based motion detector is used to sense movement of people, animals, or other objects. They are commonly used in burglar alarms and automatically-activated lighting systems. They are commonly called simply "PIR", or sometimes "PID", for "passive infrared detector". An individual PIR sensor detects changes in the amount of infrared radiation impinging upon it, which varies depending on the temperature and surface characteristics of the objects in front of the sensor.



Figure 3. PIR Sensor

#### 3.5 Fingerprint Module:

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.



Figure 4. fingerprint Module

### 3.6 4\*4 Matrix Switch keypad Board:

Typically one port pin is required to read a digital input into the controller. When there are a lot of digital inputs that have to be read, it is not feasible to allocate one pin for each of them. This is when a matrix keypad arrangement is used to reduce the pin count. Therefore, the number of pins that are required to interface a given number of inputs decreases with increase in the order of the matrix

### 3.7 LCD

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in colour or monochrome.

### 3.8 GSM

GSM (Global System for Mobile communication) is a digital mobile telephony system that is widely used in Europe and other parts of the world. GSM uses a variation of time division multiple access (TDMA) and is the most widely used of the three digital wireless telephony technologies (TDMA, GSM, and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1800 MHz frequency band. GSM, together with other technologies, is part of the evolution of wireless mobile telecommunications that includes High-Speed Circuit-Switched Data (HSCSD), General Packet Radio System (GPRS), Enhanced Data GSM Environment (EDGE), and Universal Mobile Telecommunications Service (UMTS).

### 3.9 Door lock Servomechanism –



Figure 5. Door lock servomechanism

### 3.10 Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

### 3.11 Relay

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal.

## IV. RESULT AND ANALYSIS

### 4.1 Simulation diagram prototype design in proteus.

Hence we design final simulation power supply in proteus which gives power 5v and 12v to components that is Fingerprint module, Arduino, PIR sensor, GSM Module, servomotor, IR pair sensor.

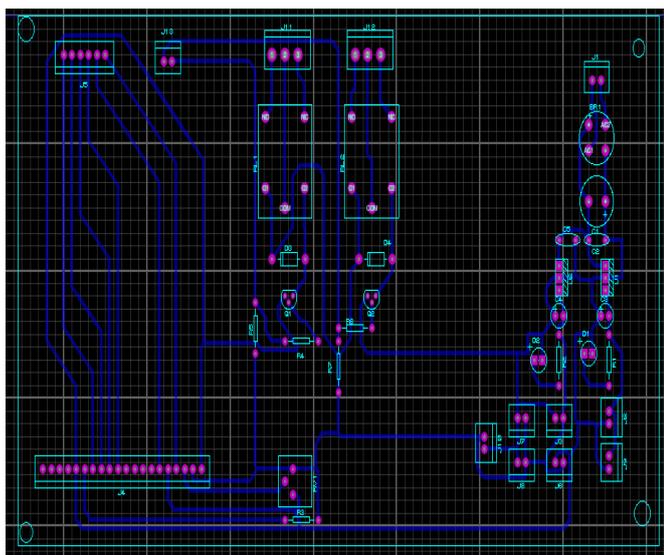


Figure 6. simulation design of system

#### 4.2 Hardware Result:

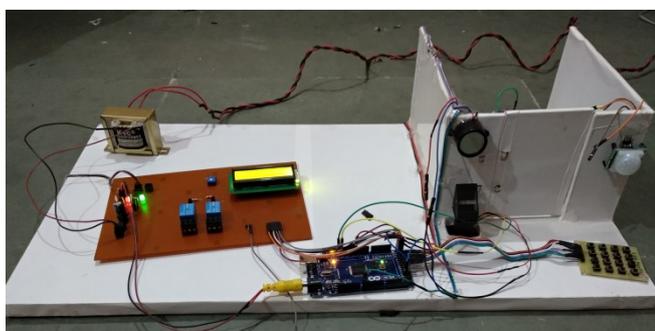


Figure 7. Hardware results of system

The final fabricated exam control room security system model is working which gives total security for exam control room. When Authorized person scan his fingerprint then control room door open successfully. otherwise any one try to open exam control room then buzzer is on and send message using GSM to principal of college.

#### V. CONCLUSION

Hence the system fingerprint scanner system provides good solution to the Exam control room in colleges. Our purpose will be overcome the question paper and answer sheets security issues in final exam. User means authorized person is use this system is more comfortable to the secured of exam control room or the question papers in exam control room.

#### VI. REFERENCES

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