Automated Environment Control and Security System

Saran Madan Najuka Sankhe Sonal Sonawane Raj Pawar

Department of Information Technology
Fr. C.R.I.T, Vashi, Navi Mumbai.

ABSTRACT
Automated environment control and security system automates environment control and detects unauthorized entry in a room. This system makes use of an infrared sensor to detect unauthorized entry into the room and sends an update to the person in-charge. The system has a two way communication in which the person in-charge can also monitor the ongoing activities in the room via a camera present in the room. The environment control component handles the automation of various lighting and cooling devices such as air conditioners, fans and light. The devices can also be controlled externally by the person in-charge through a mobile phone. The system can be controlled from a single computer. This system can be used for small offices, shops, homes and warehouses.

General Terms
Automated Lighting Automation, security, sensor

Keywords
Automation, Environment control, Remote Control, Security, Sensors

1. INTRODUCTION
Automation plays an increasingly important role in the world economy and in daily experience. The main idea of automated environment control and security system is to integrate security with environment control system which provides ease to users. This project will control environment of the room by automatically turning on the lights/fans automatically when a person enters the room. Passive infrared sensor (PIR) is used to detect presence/absence of a person in the room. All lights/fans will automatically get switched off if no one is in the office for specified time say ten minutes and after office hours. GSM modem is used for sending short message service (SMS) from computer to the person in-charge's mobile as unauthorized alert update as well as from the user's mobile to computer that automatically enables the controller to take any further action such as to switch ON and OFF the home appliances such as light, air-conditioner etc.

In case of security system, when an unauthorized person enters the room the system will detect his presence and send an alert to the person-in charge on to the mobile. This system can be used for small offices, cabins, shops, homes and warehouses.

There are many existing systems that provide intrusion detection and environment control. However, the existing Intrusion detection system using mobile device and the environment control systems cannot be controlled remotely. For the intrusion detection system using mobile device, problem occurs when the captured images have to be sent to the user via mms. This problem is because in a mobile device, sending an mms cannot be triggered automatically and requires a person to send it. In Passive infrared (PIR) sensor based environment control system sensor is used for human presence detection. As a person enters the room light and fan will automatically get switched on and if no one is there in the room it will get switched off. No security system is provided for unauthorized entry. The Passive infrared sensor based environment control system lacks security system. The intrusion detection system is for security but environment control is not available in this system. Whereas Automated Environment control and security system has combination of both the security as well as automated environment control.

2. SYSTEM DESIGN AND DESCRIPTION
This system provides automated environment control using PIR (Passive Infrared) sensors and unauthorized entry detection. For this we require sensors to detect presence /absence of a person in the room, camera to capture image of unauthorized person who has entered the room, mobile to receive alert update and remotely control the environment of the room.

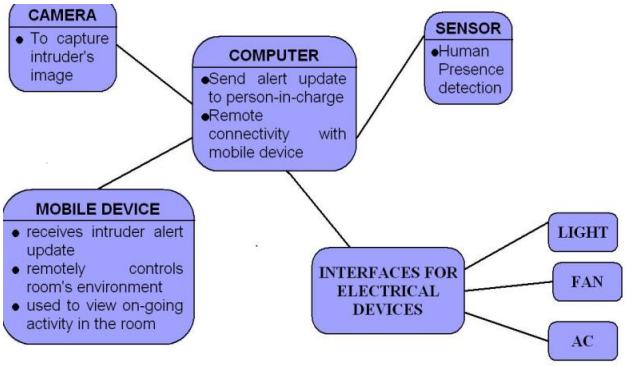

Figure 1: Block diagram of the system.

Block diagram of automated enviornment control and security system is as follows :

1) Computer*:*
Computer is main module of this system and coupled with sensors, lighting devices, camera and mobile device. This system uses a remote connection between the computer and the mobile device; therefore connectivity problems faced by existing systems are resolved.

2) Mobile Device*:*
The person-in-charge can remotely control the system using his mobile device. An alert is received on the mobile device when an unauthorized person enters the room.

3) Lights/Fans/AC Interfaces:
These lighting devices are used in room and interfaced with computer via a microcontroller which controls them.

4) Camera:
Camera can be used for recording people involved in heists and break-ins .When a person enters the room during non-working hours, the system will detect his presence and a camera can capture his image and send it to the person-in-charge.

5) Sensor:
The sensors are used to detect presence/absence of a person. All fans/lights will automatically get switched on when a person enters the room.

3. SYSTEM IMPLEMENTATION

For implementation of the system circuit diagram is as follows:

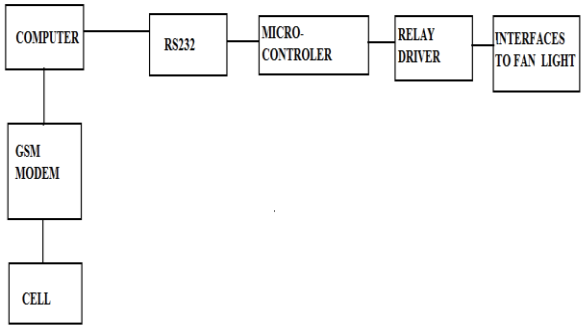

Figure 2: Implementation diagram of the system.

1) Relay Driver*:*
We cannot directly connect the outputs of the serial to parallel chip to the relays. The reason behind this is that the serial to parallel chip pins would burn out with the 12V being applied to them hence relay driver IC is required. The most commonly available driver chip (ULN2803)

2) Relay*:*
A relay is an electrical switch that opens and closes under control of another electrical circuit. Relay is used in the circuit because it is an electrical operated switch that connected to the output. A relay in this system is an electrical switch that opens and closes under the control of microcontroller.

3) GSM Modem:
GSM module is used for receiving short message service (SMS) from user's mobile phone that automatically enable the controller to take any further action such as to switch ON and OFF the home appliances such as light, air-conditioner etc.SMS is also send to security person in case of intrusion. The system was integrated with microcontroller and GSM network interface using assembly language.

4) PC Serial port (RS232):
A serial port is a serial communication physical interface through which information transfers in or out one bit at a time. In RS-232, user data is sent as a time-series of bits. Both synchronous and asynchronous transmissions are supported by the standard.

4. CURRENT STATUS OF PROJECT

Currently we have completed the remote connection between the computer and mobile device using GSM modem. Also the circuit required to control the electrical devices is ready. This circuit is interfaced with the computer.

5. CONCLUSION

With the aim of reducing wastage of electricity and providing cheap and efficient security system for small offices, homes, cabins, shops and warehouses, we have proposed the environment control and security system. With this system, we hope to make environment control and security easily available to small scale setups.

The steps taken to implement this system, as documented above, display our ideology, research and efforts towards the successful deployment of the proposed system.

6. REFERENCES

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