HOME LOCKER SURVEILLANCE WITHOUT USING CCTV CAMERA

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Abstract - *An embedded system is so important in today's automation .Surveillance is most important and needed in all kind of places to avoid any misbehaves. Here, introducing a new method without using CCTV camera for surveillance in the home, bank and all other places with low cost, low power and also avoid memory usage .This was with the combination of GSM SIM 800A, Pyro electric infrared sensor (PIR), ultrasonic sensor and ARDUINO microcontroller. In this method PIR is placed in the top of the ceiling of the locker. The main goal of our project is to avoid storage space of camera and very less power consumption. New feature introduced in our project from the base paper was activation of actuator when the thief is detected in PIR sensor.*

Key Words: **Surveillance, Home locker, without CCTV PIR sensor, Actuator.**

1. INTRODUCTION

Surveillance can be said as protecting the things and objects safely. The surveillance implemented in every place, like home surveillance, bank locker surveillance, vehicle surveillance, home locker surveillance. Surveillance is mainly done for anti-thief and stopping crime activities [1].For this surveillance embedded system and automation system is majorly implemented. In embedded any of the controller or processor is used to program the chip like ARDUINO, ATMEGA168 and ARM7TDM15 etc [2].ARDUINO micro controller is a 8 bit AVR microcontroller likewise every microcontroller has some specific bit range.

In our project we provide security system using ARDUINO microcontroller PIR and actuators chloroform and avoid CCTV camera storage device to provide with low cost and low power conception GSM[3]. In this project we use GSM SIM800A module for data transmission to the authorized person about the thief entered in the hous[4]. This is very cheapest method when compared to older method. The chloroform is used make the thief unconscious for several minutes.

2. EXISTING METHOD

In Existing Method , we used vision based surveillance security system with the help of CCTV camera .Here , Pyro electric Infra Red sensor and GSM modem are built around the At mega 328 controller. When PIR sensor detect intruder is present then it gives trigger to buzzer and simultaneously a SMS to predefined number through GSM modem[5]. Arduino board turns ON web camera through software module for capture images. The captured images viewed by user on their mobile[6].

The main disadvantage of this method is Only Photo of the thief is captured, But the thief cannot be caught instantly. The Web camera is costly and only SMS comes to the Authorized number.

3. PROPOSED METHOD

This system is based on Embedded and Networking based Technology. In our proposed system, The PIR sensor that detect the thief when steels the home locker. The output of the PIR sensor is send into the ARDUINO microcontroller when thief's are detected the input from the controller activates output pins which act as input to the motor driver where it clearly shown in the block diagram . The actuator rotate in forward for 5 seconds that time chloroform is pressed and again it rotate in the Reverse directions. GSM SIM 800A module which is the transceivers that sends the data of "Thief entered into the home" from the ARDUINO microcontroller and the mobile act as the receiver. After a one minute Exhaust fan get activated to exhaust the chloroform in the home.

With the help of the proposed method Actuator is used for Pressing chloroform unit. When the chloroform is pressed the thief become unconscious he/she captured suddenly. After a one minute exhaust fan get activated so the chloroform present in room is exhausted. SMS send to the authorized person.

4. OBJECTIVES

Surveillance is most important security systems in home, industry, office, shops, etc. The main objective of this paper is to reduce power, cost and number of sensors in home surveillance systems. Traditional surveillance system suffer from an unnecessary waste of power. With low power usage security and safety is one of the most discussed topics in almost every field like surveillance industrial applications, offices and in general, in smart environments. The main goal of our project is to avoid storage space of camera and very less power consumption. Therefore it is well suited for home surveillance system where we can instantly catch the thief.

5. METHODOLOGY

Surveillance can be said as protecting the things and objects safely. The surveillance implemented in every places, like home surveillance, bank locker surveillance, vehicle surveillance, home locker surveillance. Surveillance is electric infrared sensor (PIR) HC-SR501, ultrasonic sensor and ARDUINO microcontroller. Here PIR is placed in the top of the ceiling of the locker. The PIR sensor that detects the thief when steels the home locker. The output of the PIR

sensor is send into the Arduino microcontroller. When thieves are detected, the output from the controller activates output pins which act as input into the motor driver. For programming the microcontroller the main software's required are Embedded C and Arduino IDE.
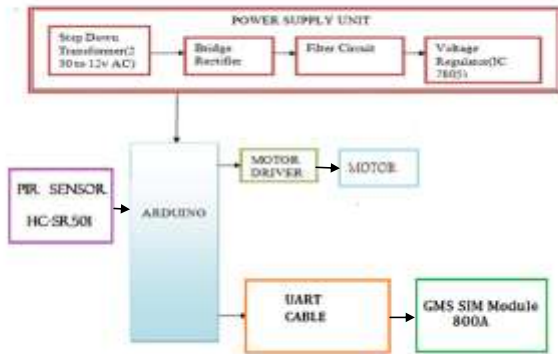

Fig-1: Block Diagram

1.1. Power Supply

Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.

Power supply unit is the combination of Step down transformer, Bridge rectifier, filter circuit and the voltage regulator
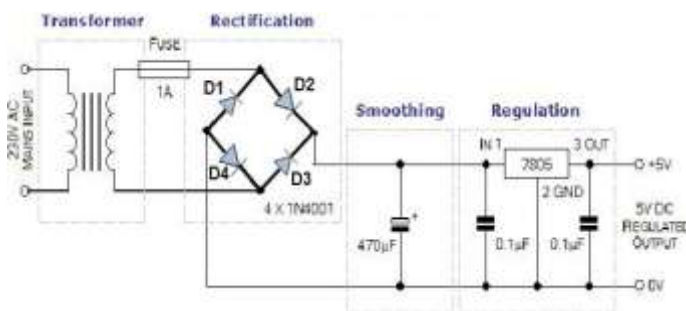

Fig-2: Power Supply Unit

1.2. Arduino

Arduino is an open source programmable circuit board that can be integrated into wide verity of maker space projects both simplex and complex. This board contains a microcontroller which is able to be programmed to sense and control objects in the physical world. By responding to sensors and inputs, the arduino is able to interact with a large array of outputs such as LEDS, motor and displays. Because of it's flexibility and low cost, Arduino has become a very popular choice for makers and maker space
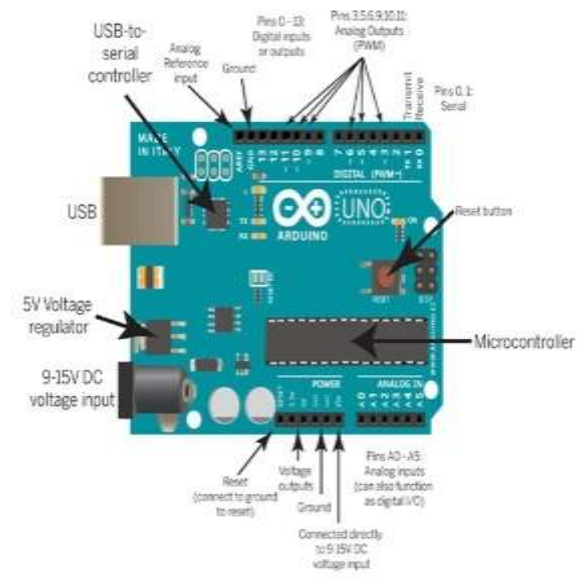

Fig-3: Arduino microcontroller

1.3. Pyro Electric Infrared Sensor (PIR) HC-SR512

A Pyroelectric Infrared sensor (PIR sensor) HC-SR501 is an electronic device that measures infrared (IR) light radiating from objects in its field of view. PIR sensors are often used in the construction of PIR-based motion detectors. Apparent motion is detected when an infrared source with one temperature, such as a human, passes in front of an infrared source with another temperature, such as a wall.

Fig-4: PIR sensor

1.4. Motor Driver

A motor driver is an integrated circuit chip which is usually used to control motors in autonomous robots. Motor driver act as an interface between Arduino and the motors .The most commonly used motor driver IC's are from the L293 series such as L293D, L293NE, etc. These ICs are designed to control 2 DC motors simultaneously. L293D consist of two H-bridge. H-bridge is the simplest circuit for controlling a low current rated motor.
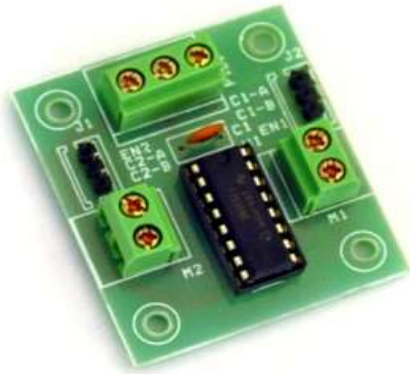
Fig-5: Motor driver

1.5. Actuator

An actuator is a type of motor that is responsible for moving or controlling a mechanism or system. In simple terms, it is a "mover". An actuator requires a control signal and a source of energy. The control signal is relatively low energy and may be electric voltage or current, pneumatic or hydraulic pressure, or even human power. It's main energy source may be electric current, hydraulic fluid pressure, or pneumatic pressure, and converts that energy into motion.

Fig-6: Actuator

1.6. Dc mini exhaust fan

DC motors differ from traditional DC motors in significant ways. The most obvious and important difference is the rotor winding. Instead of coils wound around a stack of iron laminations, the coil is formed as a thin hollow cylinder.

Fig-7: Mini exhaust fan

1.7. Output unit

An output device is any device used to send data from one device to another one device or the user. Most computer data output that is meant for humans is in the form of audio or video. Thus, most output devices used by humans are in these categories. Here in this project the GSM SIM800A sends the message to the authorized number and also to the police station. SMS can alert the authorized person about the theft, so we can easily catch the thief.

Fig-8: Mobile Phone

6. INTERNAL CIRCUIT DIAGRAM

Arduino UNO has 20 pins. 6 pins are analog input and 14 pins are digital input and the output analog input reads the signal from the pyro electric infrared sensor (PIR).PIR sensor has one input (Vcc), output (out) and ground (GND). The output of the PIR sensor is given in the digital input of Arduino.

The Arduino has an inbuilt voltage regulator which allows only 5V to arduino. The voltage range should be 5V to 16V,it should not exceed 20V.20V may destroy the mechanism. Arduino have ATMEGA328 microcontroller in which the program can be installed using USB cable connecting with the computer. We can power arduino using USB cable with the computer. If we don't want our kit always connected to the computer, the we can provide an external power source through Barrel Jack. If we want to "reboot" the arduino program, we have got a reset button.
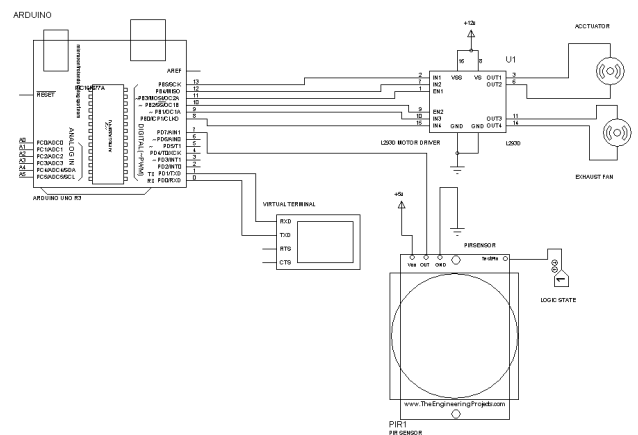

Fig-9: Internal Circuit Diagram

7. DESIGN FLOW

When the PIR sensor detects the presence of intruder it automatically starts sending signals to the Arduino microcontroller. i.e. the PIR sends its output to the Arduino from where the output is send to the motor driver. If the PIR does not detects any human temperature it keeps on monitoring the presence of intruder near to the locker. The output of the Arduino microcontroller is sent to the motor driver. The motor driver can connect two motors at the same time. Here the actuator and the exhaust fan is connected with the motor driver. When the output of the motor driver is sent to the actuator, its starts rotating in forward and backward direction for 5 seconds and emits the chloroform in that room.

At this time the intruder becomes unconscious. To protect the thief from the going to the death condition, the chloroform threshold level is checked. If the chloroform level is greater than the normal threshold level then automatically exhaust fan is switched on. So the chloroform in that room is exhausted and also thief can be caught instantly.
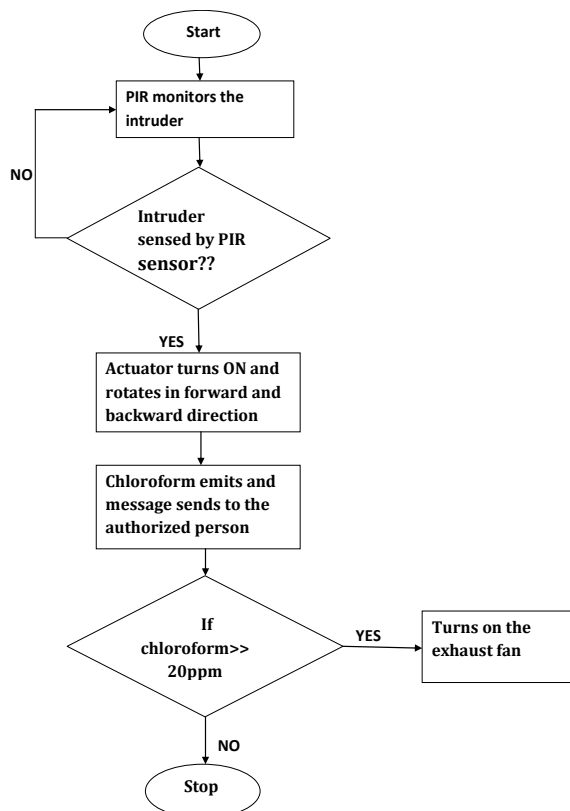

Chart-1: Flow Chart representation

8. CONCLUSION

Since the surveillance is most important and needed in all places, the security system with low cost and low power consumption is most needed to avoid the theft and other misbehaves. Here we implemented a new method without using CCTV camera for surveillance in the home, bank and all other places .It's implemented with low cost, low power and also to avoid memory usage. We have provided security system using Arduino microcontroller, PIR and actuators chloroform. Avoided CCTV cameras storage device and provided with low cost and low power GSM.

The information about the theft is sent to the authorized person using the GSM module which makes easy for transforming the information. The output device in this case is the mobile phone through which the message or the missed call is sent to the user.

9. REFERENCE

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