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Advance Security System with Intruder Image Capture and Forward Through Email

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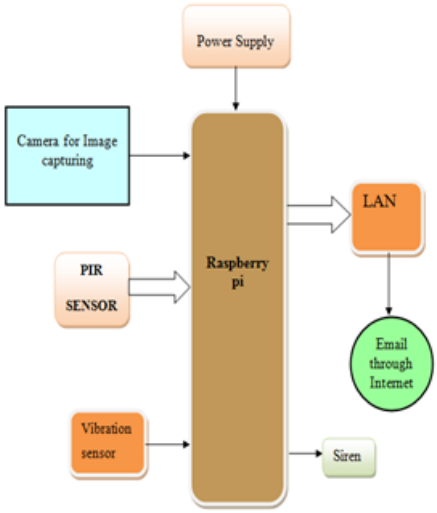
ABSTARCT:

Security is primary concern everywhere and for everyone. Every person wants his home, industry etc to be secured. This project describes a security system that can monitor an industry and home. This is a simple and useful security system and easy to install. Here our application uses Raspberry Pi as its controller and PIR sensor which detects presence of a person where ever we place this module either at a door near home or at offices, factories or any other place where we need monitoring every minute for the purpose of security. Through the camera image of the person is captured whenever PIR senses presence of a person and our controller sends those image to the pre-stored e-mail address through LAN. So that one can have the knowledge of the person appeared at that instant. A vibration sensor is also connected to identify if someone tries to open the door and a siren is given to alert surrounding people in that case.

INTRODUCTION:

Passive Infrared sensor (PIR sensor) is an electronic device that is being used to measure the 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 wall. All objects above absolute zero emit energy in the form of radiation. Usually infrared radiation is invisible to the Human eye but can be detected by electronic gadgets designed for such a purpose. The term passive in this instance means that the PIR device does not emit an infrared beam but merely passively accepts incoming infrared radiation. "Infra" means below our ability to detect it visually and "Red" is because of its Color representation which shows the lowest energy level of the color RED and applies to many sources of invisible energy.

Block Diagram



The **Raspberry Pi** is a credit-card-sized single-boar computer developed in the UK by the Raspberry Pi Foundation . The Raspberry Pi has a Broadcom BCM2836/2837 system on a chip. It does not include a built-in hard disk or solid-state drive, but Uses an SD card for booting and long-term storage.

Modules Used:

Raspberry pi, PIR sensor, LAN, Camera

Existing System:

This project describes a security alarm system that can monitor an industry and home. This is a simple and useful security system and easy to install. This vibration detector is realized using readily available, low cost components.

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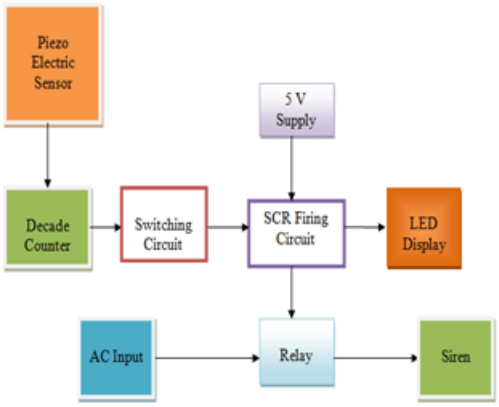
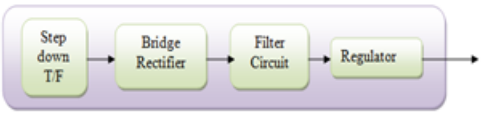
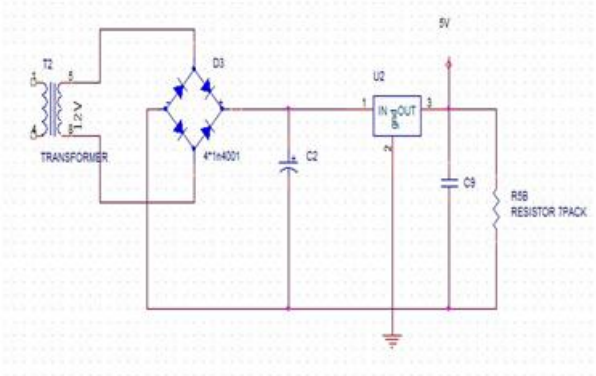
One of its many applications is in a rolling shutter guard for offices and shops. The detector will sense vibration caused by activities like drilling and switch on the connected load (bulb, piezo buzzer, etc) to alert you.



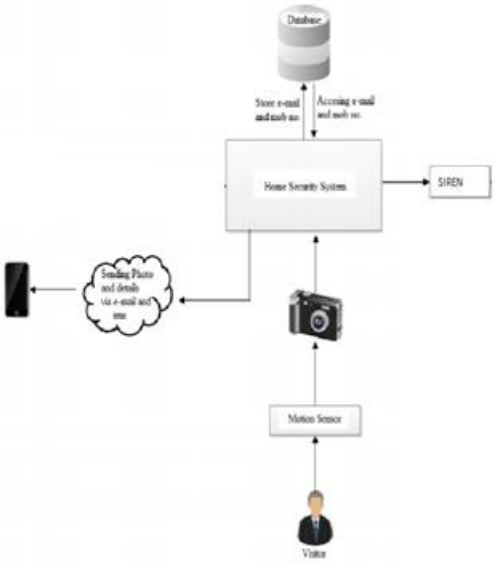
I. Power Supply Section:



This project uses regulated 5V, 1A power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac out put of secondary of 230/12V step down transformer.

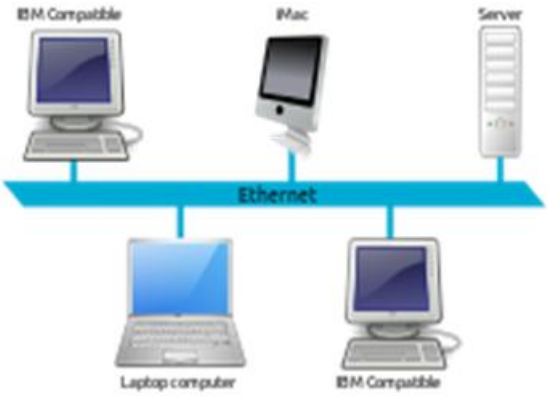


Architecture:



II. LAN:

A local area network (LAN) is a computer network that interconnects computers within a limited area such as a home, school, computer laboratory, or office building, using network media. The defining characteristics of LANs, in contrast to wide area networks (WANs), include their smaller geographic area, and non-inclusion of leased telecommunication lines. ARCNET, Token Ring and other technology standards have been used in the past, but Ethernet over twisted pair cabling, and Wi-Fiare the two most common technologies currently used to build LANs.



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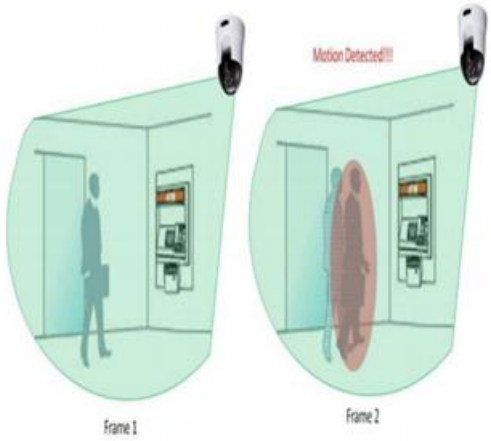
III. PIR SENSOR:

In a PIR-based motion detector (usually called a PID, for Passive Infrared Detector), the PIR sensor is typically mounted on a printed circuit board containing the necessary electronics required to interpret the signals from the pyroelectric sensor chip. The complete assembly is contained within a housing mounted in a location where the sensor can view the area to be monitored. Infrared energy is able to reach the pyroelectric sensor through the window because the plastic used is transparent to infrared radiation (but only translucent to visible light). This plastic sheet also prevents the intrusion of dust and/or insects from obscuring the sensor's field of view, and in the case of insects, from generating false alarms.



Motion Detection

IV. Vibration sensor:

A vibration sensor is a device that uses the piezoelectric effect, to measure changes in pressure, acceleration, strain or force by converting them to an electrical charge. The prefix piezo- is Greek for 'press' or 'squeeze'.

V. SIREN:

A **siren** is a loud noise maker. Most modern ones are civil defense or air- raid sirens, tornado sirens, or the sirens on emergency service vehicles such as ambulances, police cars and fire trucks. There are two general types, pneumatic and electronic.

RASPBERRY-PI

Model

- Brand: Raspberry Pi
- Model: 3 Model B

Bundle

- CPU: Broadcom BCM2837 64bit ARMv8 QUAD Core 64bit Processor powered Single Board Computer running at 1.2GHz
- Memory: 1GB RAM

Image of the board showing SD card

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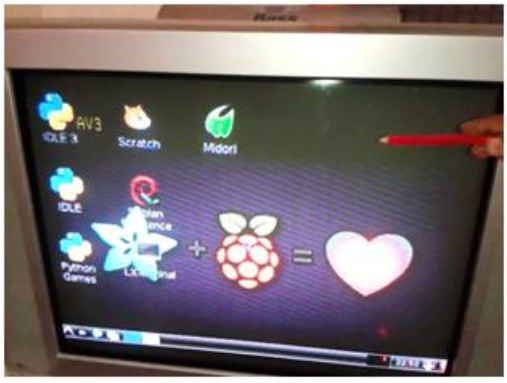
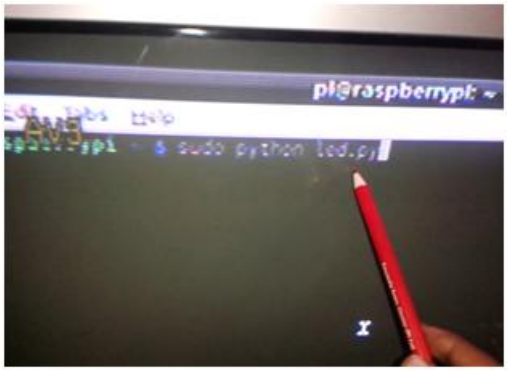
OS used in Raspberry pi is Linux



Coding will be done in python language



Project code:

```
#$sudo apt-get install ssmtp
#$sudo apt-get install mpack
#$sudo nano /etc/ssmtp/ssmtp.conf
#AuthUser=raspberry2email4970@gmail.com
#mailhub=smtp.gmail.com:465
#rewriteDomain=gmail.com
#AuthUser=username
#AuthPass=password
#FromLineOverride=YES
#UseTLS=YES
import RPi.GPIO as GPIO
import time
import os
#adjust for where your switch is connected
buttonPin = 4
buttonPin1 = 5
GPIO.setmode(GPIO.BCM)
GPIO.setup(buttonPin,GPIO.IN)
GPIO.setup(buttonPin1,GPIO.IN)
while True:
#assuming the script to call is long enough we can ignore bouncing
if (GPIO.input((buttonPin)|(buttonPin1))):
#this is the script that will be called (as root)
os.system("fswebcam -r 960x720 -d /dev/video0 /home/pi/webcam.jpg")
os.system("mpack-s \"Security Alert\",\"Intruder Detected,pictureattached\" /home/pi/webcam.jpg doorbell5845@gmail.com")
```

VI. ADVANTAGES:

- Highly-flexible
- Fit & Forget System
- No need of human effort
- High security is provided

VII. APPLICATIONS:

- Museums
- Home / Office security
- Jeweler shops
- Banks

VIII. CONCLUSION:

The project **"**Advance Security System With Intruder Image Capture And Forward Through Email**"** is successfully tested and implemented. This can be used for many applications in security purpose for Houses, Banks, Jeweler shops.

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