

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.

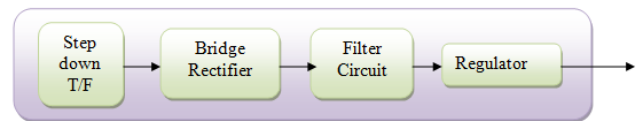
Through the camera image of the person is captured whenever PIR senses presence of a person and our controller sends those image to the pre-stored e-mail address through LAN. So that one can have the knowledge of the person appeared at that instant. A vibration sensor is also connected to identify if 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. The Raspberry Pi is a credit-card-sized single-board computer developed in the UK by the Raspberry Pi Foundation. The Raspberry Pi has a Broadcom BCM2836 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.

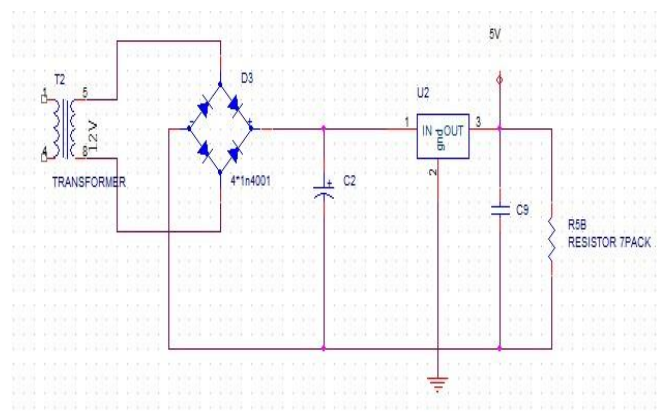


MODULES USED:

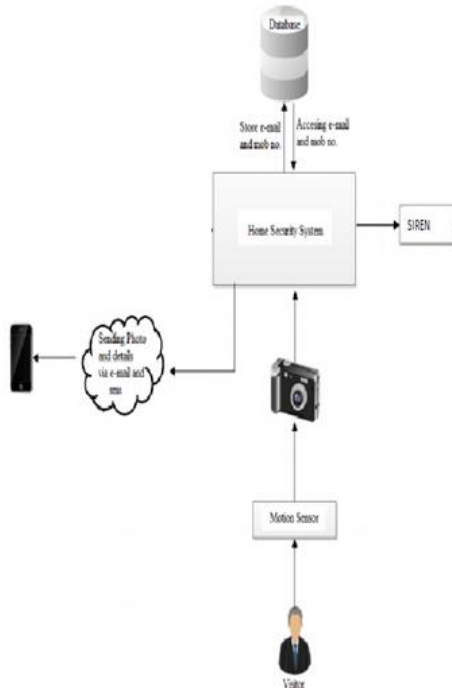
Raspberry pi, PIR sensor, LAN, Camera.

I. Power supply section:

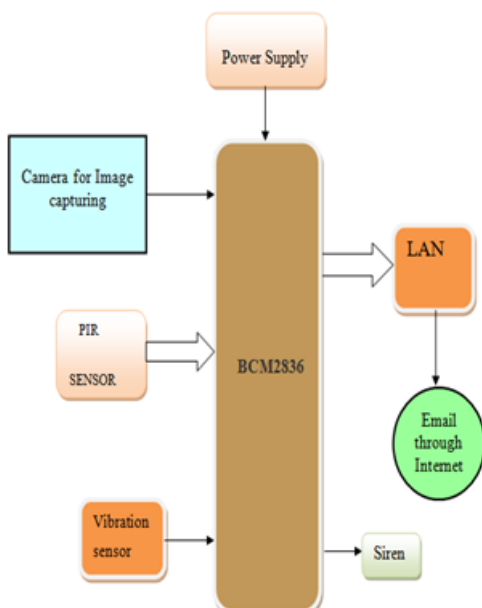
This project uses regulated 5V, 1A power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.



Architecture

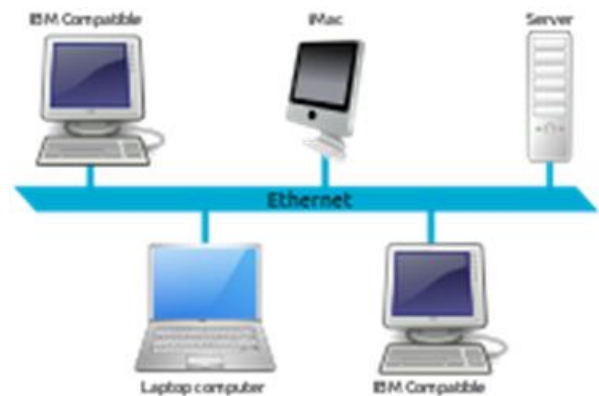


Block Diagram



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-Fi are the two most common technologies currently used to build LANs.

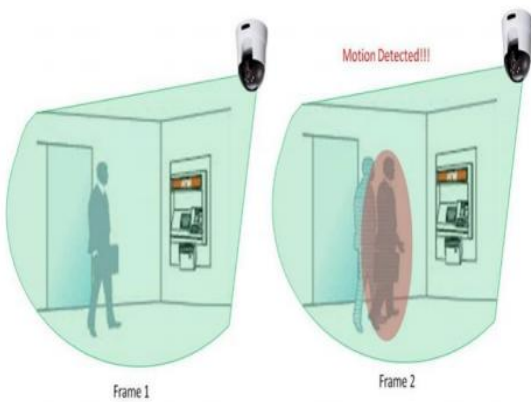
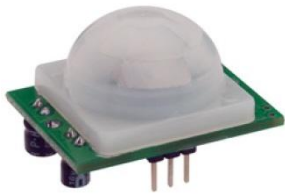


III. PIR SENSOR

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.

ambulances, police cars and fire trucks. There are two general types, pneumatic and electronic.



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

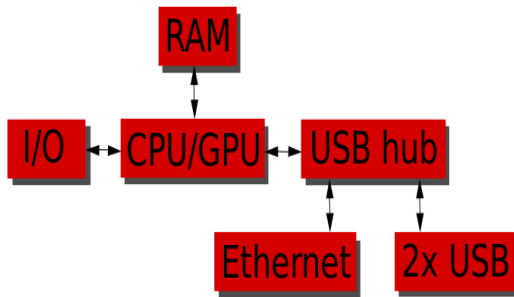
A siren is a loud noise maker. Most modern ones are civil defense or air-raid sirens, tornado sirens, or the sirens on emergency service vehicles such as

VI. RASPBERRY-PI



The Raspberry Pi has a Broadcom BCM2836 system on a chip (SoC), which includes an a quad-core Cortex-A7 cluster. The Cortex-A7 MP Core processor is a high-performance, low-power processor that implements the ARMv7-A architecture. The Cortex-A7 MPCore processor has one to four processors in a single multiprocessor device with a L1 cache subsystem, an optional integrated GIC, and an optional L2 cache controller.

The Raspberry Pi foundation has finally released an upgraded version of the Raspberry Pi. Raspberry Pi 2 model B features much of the same ports and form factor as Raspberry Pi Model B+, by replaces Broadcom BCM2835 ARM11 processor @ 700 MHz with a much faster Broadcom BCM2836 quad core ARMv7 processor @ 900 MHz, and with an upgrade to 1GB RAM.



Basic Hardware of Raspberry-PI

Raspberry Pi 2 Model B specifications:

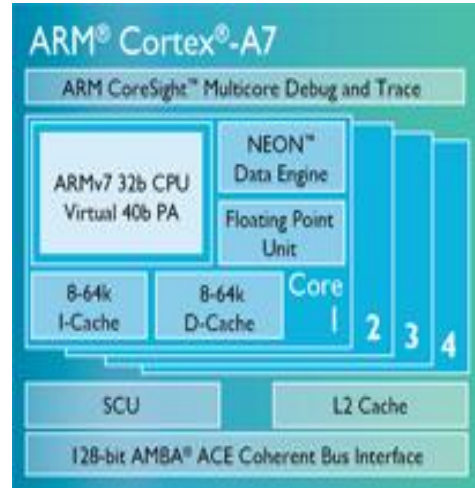
- SoC – Broadcom BCM2836 quad core Cortex A7 processor @ 900MHz with VideoCore IV GPU
- System Memory – 1GB LPDDR2 Storage – micro SD card slot (push release type)
- Video & Audio Output – HDMI and AV via 3.5mm jack.
- Connectivity – 10/100M Ethernet
- USB – 4x USB 2.0 ports, 1x micro USB for power

Expansion

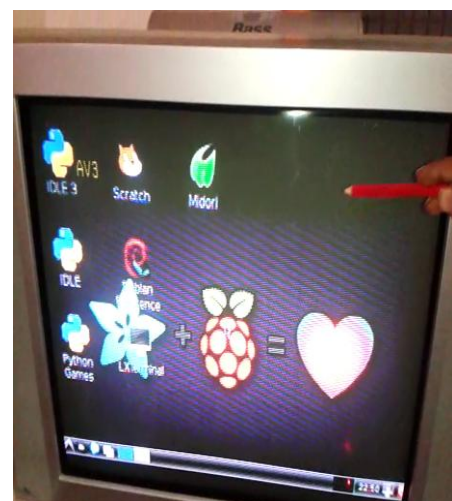
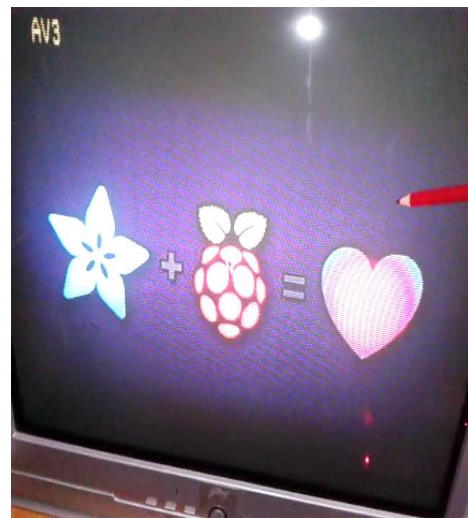
- a. 2x20 pin header for GPIOs
 - b. Camera header
 - c. Display header
- Power – 5V via micro USB port.
 - Dimensions – 85 x 56 mm



**Image of the board showing SD card
Cortex-A7 Processor**



OS used in Raspberry pi is Linux



PROJECT CODE

```
import RPi.GPIO as GPIO

import time

import os

#adjust for where your switch is connected

buttonPin = 27

GPIO.setmode(GPIO.BCM)

GPIO.setup(buttonPin,GPIO.IN)

while True:

    #assuming the script to call is long enough we can
    ignore bouncing

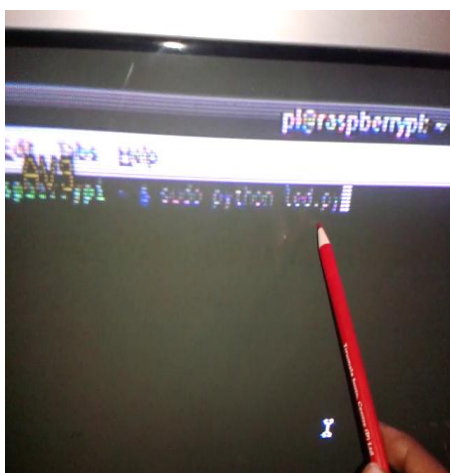
    if (GPIO.input(buttonPin)):

        #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, picture attached" /home/pi/webcam.jpg
xxxxxx@gmail.com")
```

Coding will be done in python language



VII. ADVANTAGES

- Highly-flexible
- Fit & Forget System
- No need of human effort

- High security is provided

VIII. APPLICATIONS

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

IX. 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, and Jeweler shops.

X. REFERENCES:

[1] Raspberry Pi board – raspberry pi foundation’s official website <http://www.raspberrypi.org/help/faqs/>

[2] Gareth, Mitchell “The Raspberry Pi Single-Board” Engineering and technology 7.3 (2012)8.

[3] TOA Corporation, TOA Electronics, Inc. (USA) “Closed Circuit Television Systems Fundamentals Course”, April 2005

[4] Alarm Systems “A Guide to Design, Management and Procurement”, The Engineering Equipment and materials Users Association (EEMUA) publication No.191.

[5] Raspbian –the operating system used in this paper <http://www.raspbian.org/Raspbianimages>

[6] Gantt, Charles. “Raspberry Pi Camera Module Review and Tutorial Guide” Tweak Town News. Tweak Town, 2 July 2013. Web. Oct. 2013

[7] Motion_Detection_Programming_Guide_V1.1 GM8126.

[8] Python Sending Email Using SMTP. “Tutorials Point Simply Easy Learning.” N.p., Web. Oct.2013. http://www.tutorialspoint.com/python/python_sending_email.htm