

## **IOT Based Advance Security System by Using Raspberry Pi**

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### **ABSTARCT:**

Security is primary concern everywhere and for everyone. Every person wants his home, industry to be secured. This project describes a security system that can monitor and control 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 obstacle 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 and controlling every minute for the purpose of security. Through the camera image of the person is captured when ever obstacle senses presence of a person and our controller sends those image to the pre-stored e-mail address as well as classifier the image for face detection by using Haar cascade algorithm to identify the intruder. Here developed a web page for live streaming and also to control web page buttons just like 1. Load ON 3.Load OFF (Load ON/OFF buttons will use for control the home appliances in this project electrical bulb used). 2. SMS Alert (for when we are in live steaming any abnormal person will detect then click SMS alert button it will sends to provided mobile number through GSM module), So that one can have the knowledge of the person appeared at that instant.

### **INTRODUCTION:**

This is an infrared based sensor which can be used for obstacle sensing, color detection (between basic contrasting colors line sensing, encoder sensor IR remote signal sensing, etc and also for wireless infrared communication. The sensor provides high immunity from ambient light and can be used in all light conditions quite effectively.

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. alert you. Interfacing with Raspberry pi given below.

### **Interfacing an Obstacle Sensor with Raspberry Pi:**

Raspberry Pi 2 is having a 40 pin GPIO Hedar, and a python script is written to identify the occurrence of object in front of it. As the power supplies of obstacle sensor and raspberry pi were equal and there is no need to use voltage converters in between them. The only a simple one wire connection is required in between the sensor and raspberry pi. If the sensor gives logic high pulse, then it means there is an obstacle otherwise there will be a logic low pulse given to the raspberry pi. Based on this logic, you have to write a simple python script.

### **Interfacing camera with Raspberry Pi:**

A simple usb web camera is interfaced to Raspberry Pi at the USB port and a driver is installed automatically when an internet is provided to raspberry pi. A video kernel will be called when calling a camera from the python script. 'Fswebcam' is a piece of software module which is installed on raspberry pi for accessing the camera from the python script.

### **Installing web camera server with Raspberry Pi:**

After loading up the kernel of camera from the root folder and software called 'motion' is to be installed on raspberry pi for converting a normal web camera into an IP camera.

This software will use the raspberry pi IP address for live streaming along with the port number.

### Installing local server with Raspberry Pi:

After converting a normal web camera into an IP camera and the next part you have to do is installing a local http server which converts a normal raspberry pi into a web server from where you can access GPIO pins like controlling a bulb, or sending an alert. A software called 'Flask' to be installed on raspberry pi and to do such tasks mentioned above. A python script which is acting as a back end program and a simple html page is written for front end UI. The local http server and camera server are using a common IP address and a different port number which is like a socket and port in Linux threads.

### MODULES USED:

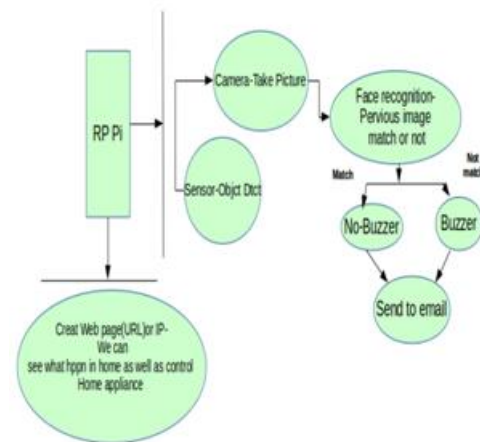
Raspberry pi, Obstacle sensor, LAN, Camera, GSM module, Bulb.

#### I. Literature survey

##### Existing method

The project describes a security alarm system that can monitor and control 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. 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.

##### Architecture



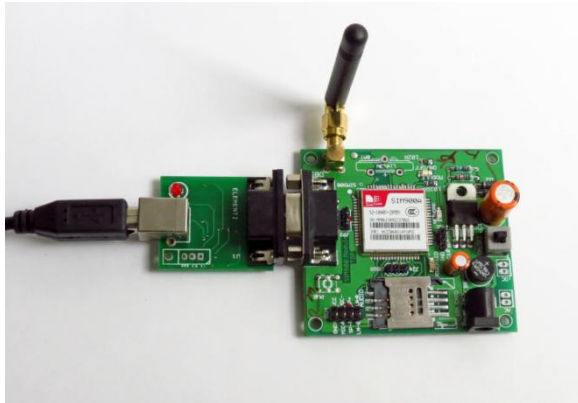
#### II. LAN

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

#### III. GSM Module

GSM (Global System for Mobile) / GPRS (General Packet Radio Service) TTL -Modem is SIM900 Quad-band GSM / GPRS device, works on frequencies 850 MHZ, 900 MHZ, 1800 MHZ and 1900 MHZ. It is very compact in size and easy to use as plug in GSM Modem. The Modem is designed with 3V3 and 5V DC TTL interfacing circuitry, which allows User to directly interface with 5V Micro controllers (PIC, AVR, Arduino, 8051, etc.) as well as 3V3 Micro controllers (ARM, ARM Cortex XX, etc.). The baud rate can be configurable from 9600-115200 bps through AT (Attention) commands. This GSM/GPRS TTL Modem has internal TCP/IP stack to enable User to connect with internet through GPRS feature. It is suitable for SMS as well as DATA transfer application in mobile phone to mobile phone interface.

The modem can be interfaced with a Micro controller using USART (Universal Synchronous Asynchronous Receiver and Transmitter) feature (serial communication).



#### IV. RASPBERRY-PI



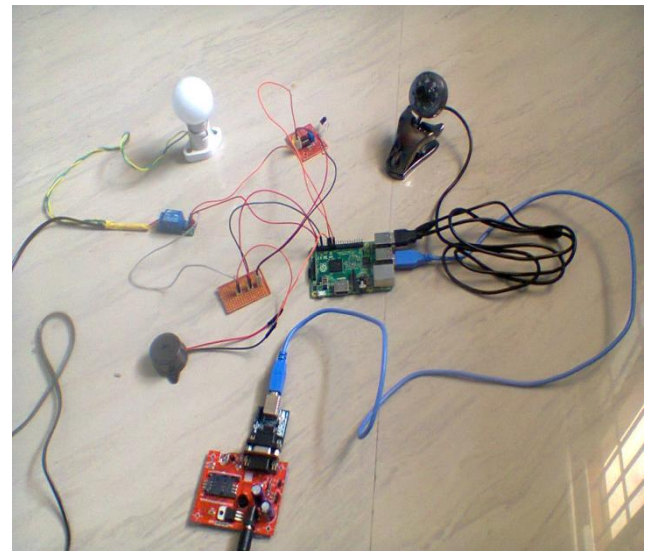
The **Raspberry Pi** has a Broadcom **BCM2836** system on a chip (SoC), which includes an a quad-core Cortex-A7 cluster. The Cortex-A7 MP Core processor is a high-performance, low-power processor that implements the ARMv7-A architecture. The Cortex-A7 MPCore processor has one to four processors in a 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.

OS used in Raspberry pi is Linux

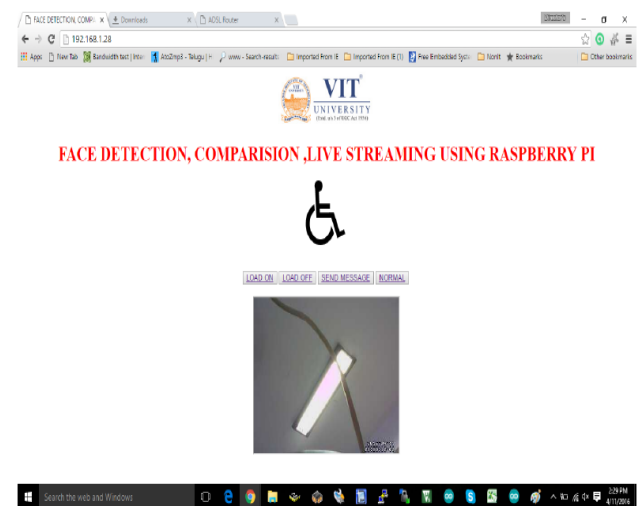


#### RESULT

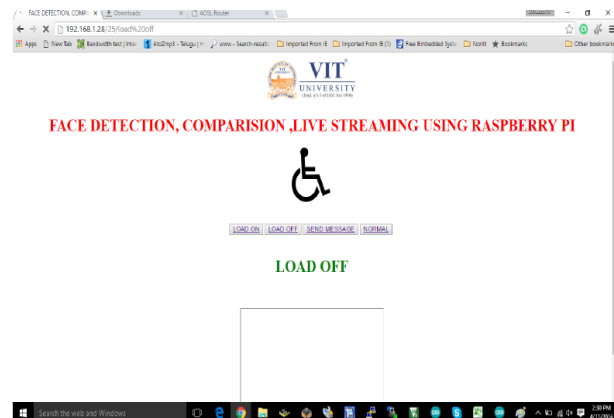
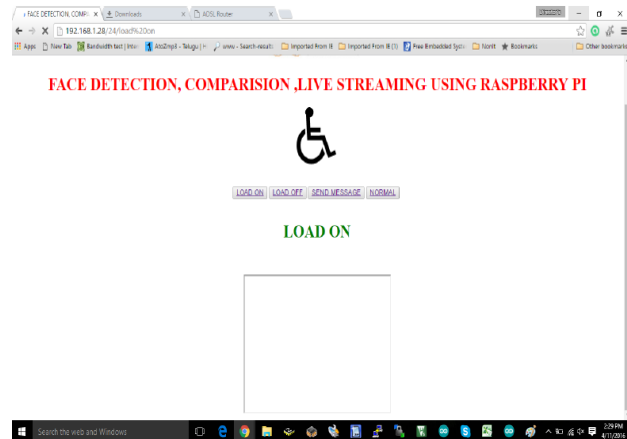
1. Connecting Hardware components with Raspberry pi



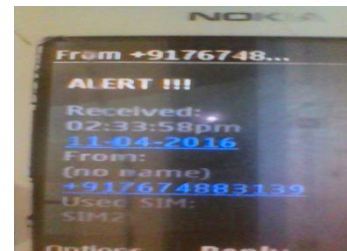
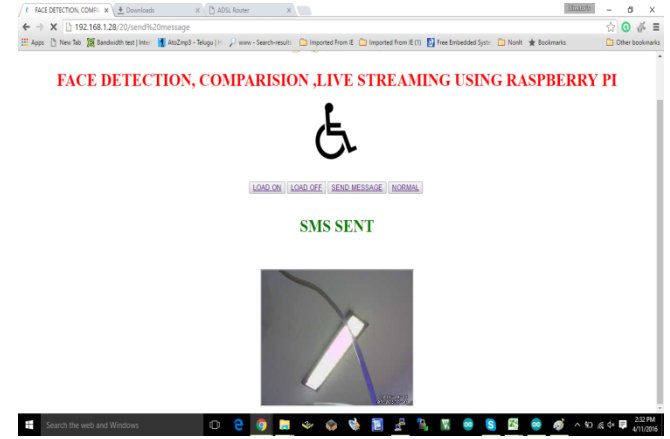
2. Live Streaming in web page using Raspberry pi



### 3. Controlling Light with ON/OFF operation from web page



### 4. Sending alert message to mobile from web page using Raspberry pi



#### V. ADVANTAGES

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

#### VI. APPLICATIONS

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

#### VII. CONCLUSION

The project “Advance Security System With Intruder Image Capture And Forward Through Email as well as classifier the image for face detection by using Haar cascade algorithm to identify the intruder. Here developed a web page for live streaming and also control home appliance using web page), ” is successfully tested and implemented. This can be used for many applications in security purpose for Houses, Banks, Jeweler shops.

**VIII. REFERENCES:**

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