Home Security Robot with Live Transmission Video Transmission and Home Automation

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ABSTRACT:

Security is primary concern everywhere and for every one. 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. Here our application uses Raspberry Pi as its controller. A PIR sensor is interfaced to the controller to detect the presence of a human and immediately captures the image using camera attached to controller and forwards through E-mail and also a buzzer alert is given to intimate others. A temperature sensor is also present at this end to find out increase in temperature and intimate others with a buzzer alert. A wireless camera is also interfaced to monitor each and every minute at the remote place in a TV. DC motors are interfaced to the controller through H-bridge circuit to drive the Robot.

We also have a LDR sensor to check whether there is day light or not and also to switch on the light during darkness.In this way security is provided through all aspects. We can move this robot either at home or at offices, factories or any other place where we need monitoring every minute for the purpose of security.The Raspberry Pi is a credit-card-sized single-board computer developedinthe UK by the Raspberry Pi Foundation . The Raspberry Pi has a Broadcom BCM2835 system on a chip which includes an ARM1176JZF 700 MHz processor Video Core IV GPU and was originally shipped with 256 megabytes of RAM, later Upgraded to 512 MB. It does not include a built-inhard disk or solid-state drive, but Uses an SD card for booting and long-term storage.

I.INTRODUCTION:

Raspberry pi is a credit- card sized computer .It functions almost as a computer . There are various surveillance systems such as camera ,CCTV etc., In these types of surveillance systems, the person who is stationary

and is located in that particular area can only view what is happening in that place .Whereas, here ,even if the user is moving from one place to another ,he/she can keep track of what is happening in that particular place. Also another advantage is that it offers privacy on both sides since it is being viewed by only one person .The other major advantage is that it is a simple circuit .the operating system used here is Raspbian OS. Raspbian OS has to be installed so that the image can be transmitted to the other place

Block Diagram
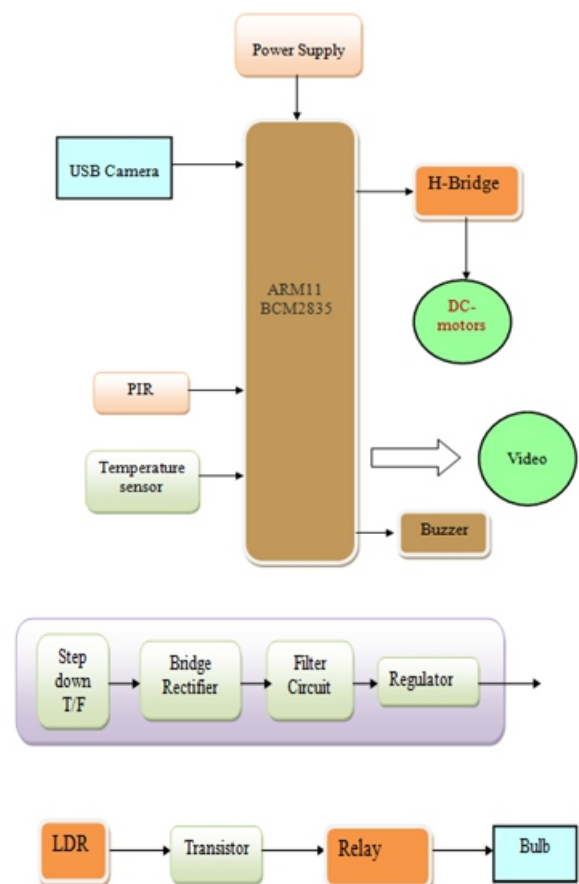
This project uses regulated 3.3V, 1A power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac out put of secondary of 230/12V step down transformer.

II.Hardware modules
Raspberry pi

The ARM1176JZF-S processor features:

• Trust Zone security extensions

• provision for Intelligent Energy Management

• high-speed Advanced Microprocessor Bus Architecture (AMBA) Advanced Extensible Interface (AXI) level two interfaces supporting prioritized multiprocessor implementations.

• an integer core with integral EmbeddedICE-RT logic

• an eight-stage pipeline

• branch prediction with return stack

• low interrupt latency configuration

• internal coprocessors CP14 and CP15

• Vector Floating-Point (VFP) coprocessor support

• external coprocessor interface

• Instruction and Data Memory Management Units (MMUs), managed using MicroTLB structures backed by a unified Main TLB

• Instruction and data caches, including a non-blocking data cache with Hit-Under-Miss (HUM)

• virtually indexed and physically addressed caches

• 64-bit interface to both caches

• level one Tightly-Coupled Memory (TCM) that you can use as a local RAM with DMA

• trace support

• JTAG-based debug.

PIR sensor:

A Passive InfraRed sensor(PIR sensor) 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 (see below). 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.
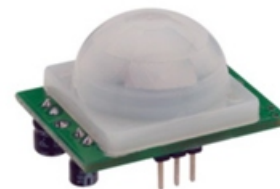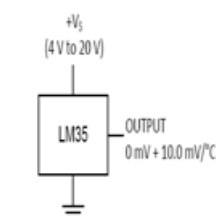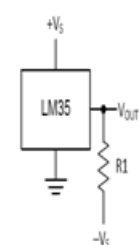

Temperature sensor:

Figure 1. Basic Centigrade Temperature Sensor (+2°C to +150°C)

Choose $R_1 = -V_S / 50 \mu A$
$V_{OUT} = 1500$ mV at 150°C
$V_{OUT} = 250$ mV at 25°C
$V_{OUT} = -550$ mV at -55°C

Figure 2. Full-Range Centigrade Temperature Sensor

• Calibrated Directly in ° Celsius (Centigrade)

• Linear + 10 mV/°C Scale Factor • 0.5°C Ensured Accuracy (at +25°C) • Rated for Full –55°C to +150°C Range

- Suitable for Remote Applications

- Low Cost Due to Wafer-Level Trimming

- Operates from 4 to 30 V

- Less than 60-µA Current Drain

- Low Self-Heating, 0.08°C in Still Air

- Nonlinearity Only ±¼°C Typical

- Low Impedance Output, 0.1 Ω for 1 mA Load

III.SOFTWARE DETAILS

STEPS TO INSTALL RASPBIAN OS

In order to install RaspbianOS,first next out of box software(NOOBS) has to be installed.

1.First step is to allocate the drive for installing OS
2.SD adaptor can also be used for this purpose
3.Download WINDISK 32 utility from source forge proj ect which is a zip file
4.Extract and run the zip file
5.Select the file and click run as administrator
6.Select the image file which was extracted above
7.Select the drive letter of the SD card in the device box
8.Click write and wait for write process to complete
9.Exit the image and eject the SD card


Fig 4:Installed Raspbian OS

IV.ADVANTAGES:

- Highly-flexible

- No need of human effort

- High security is provided

V.CONCLUSION:

Thus we have designed a smart surveillance system capable of recording/capturing video/image and transmitting to other place.It is advantageous as it offers reliability and privacy on both sides. It is authenticated and encrypted on the recieverside,hence it offers only the person concerned to view the details.Neccesary action can be taken in short span of time in the case of emergency conditions such aselderly person falling sick,military areas,smart homes,offices, industries etc.

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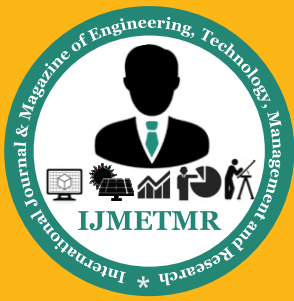
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