

## Motor Controlled Car For Surveillance Using Raspberry Pi

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**Abstract:** In the present world, everyone is worried about their safety due to increase in crime rate. This has led to an increase in the importance of a surveillance system. A system is designed for continuous monitoring and also the system provides live streaming. The system can be deployed at the anyplace i.e. office, house and some remote place where people cannot monitor the particular place. The system acts like a Robot within a local area network.

**Keywords**– Surveillance system, Live streaming, Robot.

### I. Introduction

IOT based robot plays an important role in many area where people can't reach easily [5]. As the growth rate of crime has been increased in past years, as a result, everyone is concerned about their safety and security. Due to this reason, people started to consider the significance of surveillance systems. The majority of the people are doing Internet Protocol (IP) based installations rather than analog because of IP-based installations are from anywhere. In order to make the IP-based systems affordable for the people having a low budget, we need to develop a system which is cost effective and portable. This paper describes the system which acts as a robot. This robot uses raspberry pi model for making this real-time surveillance possible by providing the installing and processing high resource software's which makes it possible to live streaming & controlling the robot.

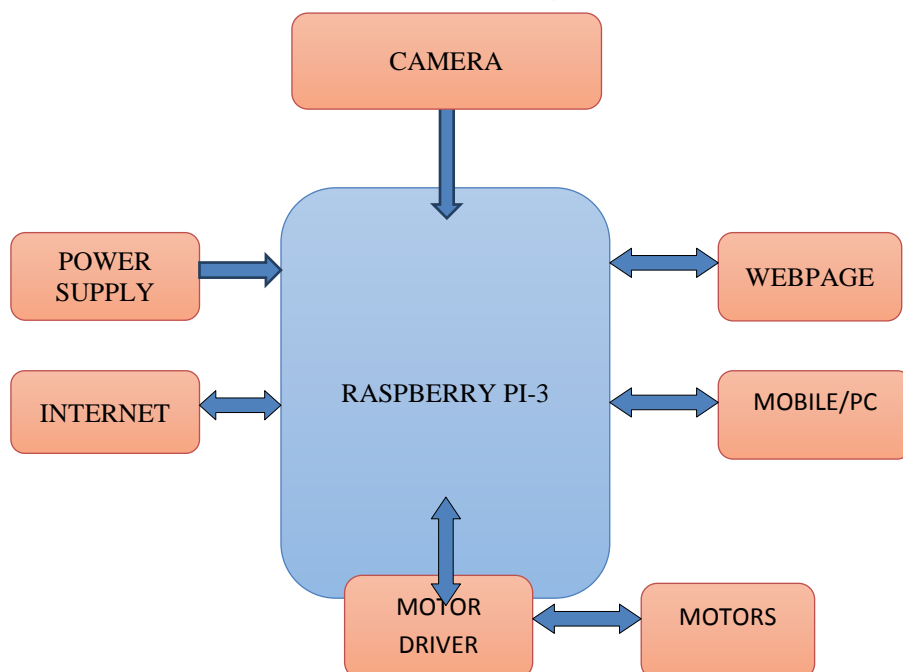
We proposed a system to build a real-time live streaming and monitoring system using Raspberry pi with installed wifi connectivity. In monitoring phase, the pi will record the video of the location in real-time. Capturing video is done through commands given through the computer to the raspberry pi. This command will be communicated to the pi using Wi-Fi. The pi camera is being used which will give a very good quality of the picture in the video. The connection of Raspberry pi with the motor driver is done using the General Purpose Input Output (GPIO) pins of Raspberry Pi. The GPIO pins are connected to the input pins of the motor shield. The output pins of the motor shield are connected to the motors. A portable charger of 2 amp current is connected to the motor shield and raspberry pi. Once the connections are done properly the raspberry pi is ready to boot up. A Python program is written for controlling the motors wherein the GPIO pins will give out the output from the raspberry pi to the motor shield. The robot movement is controlled through the directions mentioned on the web page created using Hypertext Markup Language (HTML) code and webpage Universal Resource Locator (URL) address. This process is communicated through Wi-Fi to the Raspberry Pi model B. The camera module is installed into its port and it is enabled in raspberry pi settings. For the Live Streaming of videos, MJPEG streamer is installed and configured. After the configuration steps are done just view the live streaming in the app as well as the website. Here admin rights are given to authenticate the visibility of critical information by only authentic users.

### II. Problem Statement

The first part is construction of the robotic vehicle. With the help of inbuilt Wi-Fi and network settings an internet connection is established between the robotic vehicle and the user. Then robot captures the images using a webcam and stores them into the memory. The next task is to capture and send live video feed using internet at a rate sufficient to make them seem like a live video to the human eye. The next task is to capture and send live images using internet at a rate sufficient to make them seem like a live video to the human eye. This was initially implemented using LAN before moving to internet. The desired result was achieved by sending compressed low resolution images so that transmission would not be affected in case high upload speeds were not available. Then the program was made more dynamic by varying the resolution of the video to be transmitted depending on the upload speed available at that particular time. Like for example in case of

availability of good upload speeds, high resolution video will be sent and vice versa in case of low upload speeds.

### III. Hardware Design



PI

#### 1.1 Raspberry Pi

Raspberry Pi board is a miniature marvel, packing considerable computing power into a footprint no larger than a credit card. The processor at the heart of the Raspberry Pi system is a Broadcom BCM2835 system-onchip (SOC) multimedia processor.

#### 1.2 Camera

The visual feedback is provided by a webcam. It can have a resolution of up to 25MP, Frame rate of 30FPS along with night time vision. It is plugged into the USB port of the Raspberry Pi.

#### 1.3 Power Supply

The Raspberry Pi 3 is powered by a +5.1V micro USB supply. Exactly how much current (mA) the Raspberry Pi requires is dependent on what you connect to it. It has been found that purchasing a 2.5A power supply from a reputable retailer will provide with ample power to run your Raspberry Pi.

#### 1.4 Motor driver

The L293D is a 16 pin IC, with eight pins, on each side, dedicated to the controlling of a motor. There are 2 INPUT pins, 2 OUTPUT pins and 1 ENABLE pin for each motor. L293D consist of two H-bridge. H-bridge is the simplest circuit for controlling a low current rated motor.

### IV. Software

There are many software materials like compilers and programs that have been used during the development of the system. An operating system is a program that makes it easier for the end user to use the underlying hardware. Raspberry pi supports multiple Linux distributions. Because Linux code is publicly available, different organizations have made slight changes to it and distributed it. This has led to different distributions (versions), including Red Hat, Fedora, Debian, Arch, Ubuntu and open SUSE. Some companies sell their distributions and provide paid-for support, whereas others are completely free. Free Software Foundation uses the name GNU/Linux, which has led to some controversy. Raspbian is based on the Debian distribution with some customizations for the raspberry pi. Python interpreter runs in an interactive shell to execute individual commands, or as a command line program to execute standalone scripts.

## V. Future Scope

There are lots of improvements that can be made on the current design and technology and lots of additional features can be added. We can use different types of sensor so that we can use robot in different field i.e. Temperature Sensor, Pressure Sensor, Heat Sensor, Position Sensor, Proximity Sensor. We can also add Text To Speech converter in our robot. We can also mount rotating camera on the Robot which can help to know the position of Robot accurately. We can also turn our robot as an UAV (Unmanned Aerial Vehicle) which can save our soldier in spying.

## VI. Conclusion

In this project we used raspberry pi working on raspian os. Raspian is a versatile platform and interfacing is pretty east. Here we conclude that using raspberry pi for video transmission and robot control went pretty well and the response was faster. The system can be used in different environments and several places like houses, banks, hospitals, labs and other automated systems, which dramatically reduce the hazard of unauthorized entry. But the system needs to be monitor always that the internet bills are paid in due time to keep connected to provide information to the user about what is happening in surveillance area by sending notification to email server. This system would be an alternative for expensive security systems being used.

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