

Design of Wireless Video Surveillance Robot using Raspberry-Pi



G.R.Sri Sudharsna, A.Srinivasan

Abstract— Video Surveillance plays the key role in security systems. Wireless video surveillance will be the surrogate for the standby surveillance systems. The proposed video surveillance robot can be moved in any direction according to the instructions from the webpage and it streams the captured video live over the webpage. Raspberry-pi is the heart of this robot. Two software modules, "MOTION" and "FLASK" are incorporated to get the live streaming and to transfer instructions from the webpage to Raspberry-pi. It can be used in small level military applications, monitoring systems in residence, hotels.

Keywords: Wireless Video surveillance, Raspberry-pi, Motion, Flask

I. INTRODUCTION

Tremendous development of the Technology yields the unassailable security systems. Video Surveillance is the process of monitoring a particular range of area, persons, etc. Security play the most pre-eminent role in day-to-day life. This wireless video surveillance robot can be accessed easily anywhere.

This wireless video surveillance robot consists of Raspberry-pi which is the key component that drives the robot to yield the valid streaming. The sub components of this robot are Webcam, DC motors, Motor driver IC (L293D), Chassis, Power Bank. Ease of access of the robot can be made by incorporating the Internet of Things concept. This wireless video surveillance robot can be accessed and the live streaming can be observed in the webpage by feeding the IP address of the Raspberry-pi. The Raspberry-pi and the PC/Mobile through which the robot to be accessed should be connected to the same network (WI-FI).

II. SYSTEM DESIGN

This robot is designed in a way that it can be accessed anywhere. The coverage range for the video surveillance is not limited as the robot is mobile. The system consists of two segments, hardware segment and software segment. Hardware segment comprises the the robot setup with the

Raspberry-pi and the software segment comprises of the HTML and PYTHON code.

HTML code should possess the hyperlink for the robot controls in the python code.

III. COMPONENTS

This wireless video surveillance robot requires both hardware and software. Major part of building up this robot lies in the coding part. Coding for accessing robot is done in PYTHON and for live streaming is done in HTML.

1. Raspberry-Pi

Raspberry-pi incorporated in this robot is Raspberry-Pi 3 Model B. This has been employed to process the code and to send signals to the Motor Driver IC L293D regarding the direction of motion of the robot, to enable the live streaming by processing the HTML code. Web Camera is also connected to it. Power supply for this can be provided by the power bank.

2. Web Camera

Web camera utilized should be USB compatible as it gets connected to the Raspberry-pi. It captures the motion in the direction of the robot. It continuously captures the motion and streams in the webpage via the Raspberry-pi.

3. Motor Driver Ic (L293d)

This is a 16-pin IC which drives the DC motor in the direction as instructed by the user in the webpage, via the Raspberry-pi. It gets the power from the Raspberry-pi.

4. Dc Motor

DC motors with the power supply requirement of 12V is employed in this robot. It is to move the robot in the direction instructed by the user. Two DC motors are employed in it.

5. Power Bank

Power bank is to fulfil the power requirement for the Raspberry-pi. Power bank with the features of 5 V, 1.5 A current and the battery power rating of 32 WH

6. Putty Software

Putty is an open source terminal emulator, serial console, network file transfer application. It is an amazing tool to access the Raspberry-pi (remote computer). In this software, the python code is run then only the webpage opens with live streaming and instruction labels.

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7. Mobaxterm

Mobaxterm is also a tool to access the remote computer . Here it visualizes the Raspberry-pi files by having a Raspbian OS as a virtual OS in our PC.

8. Motion Module

It is a software module that can be installed using Putty , to provide a live streaming over the webpage

9. Flask Module

It is a software module that can be installed using Putty , which can transfer the commands by the user from webpage to the Raspberry-pi.

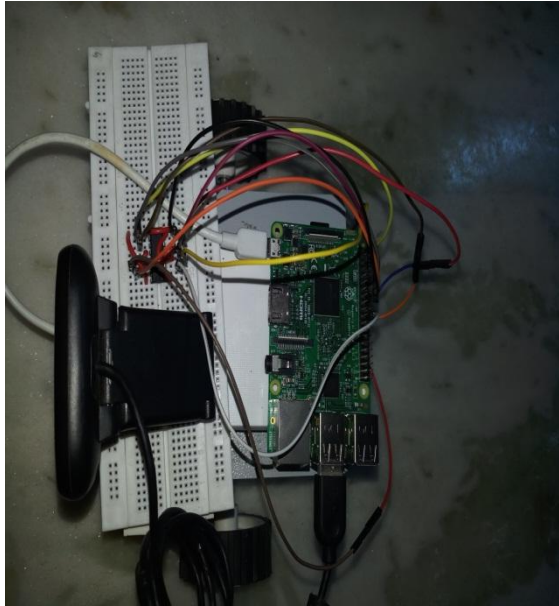


Figure 1 :Robot Model

IV. BLOCK DIAGRAM

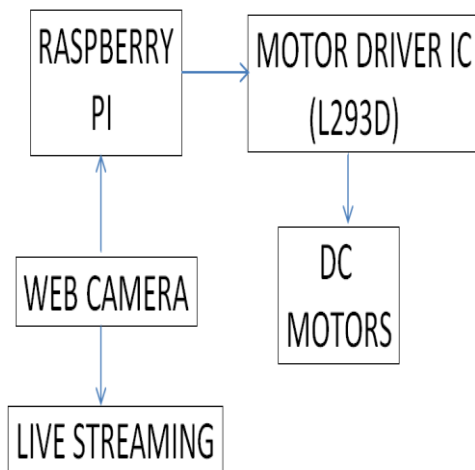


Figure 1: Block diagram of the system

V. RESULT



Figure 3 : Output

The model of the wireless video surveillance robot and the output to be obtained is shown above.

VI. APPLICATIONS

1. It will be the surrogate for the stand by CCTV cameras in residence , workplaces and public places.
2. It can be used in small level military applications.

VII. CONCLUSION

The result obtained at the conclusion states that this wireless video surveillance robot can be the surrogate for the stand by surveillance systems and it can be accessed anywhere with the condition that PC and the Raspberry-pi should be connected to the same network (WI-FI). It can surveil the areas and protect it from adversaries . HD streaming can be get from the live feed of the camera . The live streaming can be seen and robot can be accessed in the webpage by feeding the IP address of the Raspberry-pi used.

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