Surveillance Robot based on Raspberry Pi-3

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Abstract - *This paper proposes a method for controlling a wireless robot for surveillance using IOT. A web-page which has video screen for surveillance and buttons to control robot. Raspberry pi board is connected to Wi-Fi. Through webpage the data's sends a wireless command which is received by Raspberry pi board and accordingly robot moves. The Video Streaming is done using MJPG streamer program that gets mjpeg data and sends it through a HTTP session. The Raspberry pi programming is done in python language.*

*Key Words***: Raspberry Pi, IOT, Wireless Robot, Wifi, Python**

1. INTRODUCTION

Video surveillance has played supreme role in the research of last few decades. The application has wide range of purposes like traffic monitoring, understanding human activity. Different kind of cameras is used for surveillance like fixed cameras, and pan and tilt cameras. These kinds of cameras are generally used for indoor security. In indoor security system multiple cameras are mounted on wall with different angels to track object. These types of systems need a computer or a laptop for monitoring. Nowadays, most of the system uses a mobile robot with a camera for surveillance. The camera mounted on the robot can move to different locations. These types of robots are more flexible than the fixed cameras.it is given that mostly used surveillance robots are wheel robot. The wheel based robots are more suitable for flat platform. With the development in wireless communication and internet, the videos captured by wheel robot can be seen remotely on computer or laptop. The above two types of systems need computer or laptop which makes the whole system bulky. In the systems uses Bluetooth module for controlling robot using phones. But the range of Bluetooth is limited. With the development in wireless communication and internet, security systems are rapidly improving. This paper describes a method for controlling a robot using a Smartphone. The main unit of robot is Raspberry Pi. Using motor driver IC two dc motors are connected to the GPIO of Pi. A web server is built in Raspberry Pi using MJPG (Motion Joint Photographic Experts Group) streamer program. An application is built for Smartphone. The application from Smartphone will open the web-page which has a screen for video streaming and buttons for the movement of robot and camera.

1.1 Raspberry Pi 3

Fig-1: Raspberry Pi

Plug the preloaded SD Card into the Pi. Plug the USB keyboard and mouse into the Pi, perhaps via a USB Hub. Connect the Hub to power, if necessary. Plug the video cable into the screen (TV) and into the Pi. Plug your extras into the Pi (USB Wi-Fi, Ethernet cable, hard drive etc.). This is where you may really need a USB Hub. Ensure that your USB Hub (if any) and screen are working. Plug the power source into the main socket. With your screen on, plug the other end of the power source into the Pi. The Pi should boot up and display messages on the screen.

1.2 Python

Python is a widely used high-level, general-purpose, interpreted, dynamic programming language. Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than possible in languages such as C++ or Java. The language provides constructs intended to enable writing clear programs on both a small and large scale. Python supports multiple programming paradigms, including object-oriented, imperative and functional programming or procedural styles. It features a dynamic type system and automatic memory management and has a large and comprehensive standard library.

2. PROPOSED SYSTEM

It has almost all the features that are available in computer or laptop. The controlling of robot using Webpage makes the system efficient and reliable.we had created the webpage, through webpage we are going to control the robot module and also monitoring the robot via camera module. All the data will be access through internet.

A webcam is a video camera which feeds its images in real time to a computer or computer network, often via USB, Ethernet or Wi-Fi. Their most popular use is the establishment of video links, permitting computers to act as videophones or videoconference stations.

Fig -2: Surveillance Robot

Raspbian is a Debian-based computer operating system for Raspberry Pi, developed by a small team of developers. It is not affiliated with the Raspberry Pi Foundation, but the foundation provides a Raspbian image which is listed as an officially supported operating system. Raspbian is maintained by Mike Thompson and Peter Green et al. which completed the initial build in June 2012. The operating system is still under active development.
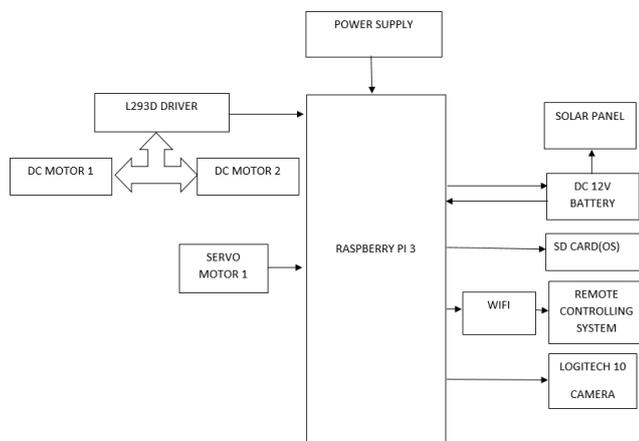

Fig -3: Block Diagram

COMPONENTS REQUIREMENT:

Component	
Raspberry Pi 3	1
Solar Panel	1
Servo Motor	1
Logic Tech Camera	1
DC Battery	1
DC Motor	2

3. CONCLUSIONS

Our project is effective in surveillance and majorly utilized in monitoring. We can access through online and survive the current happenings. It's also used in defense purpose and in some industries. Major development in surveillance purpose and useful in case of data storage also through our surveillance robot.

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