
ABSTRACT

Security is the need of the day. Terrorist attacks are on a rise throughout the world. This has led to an increasing need for surveillance, which is a very intimidating task. There are surveillance cameras in Abstract – Security is the extremity of the day. Terrorist hit are on a rise throughout the Earth. This has led to a crescent need for surveillance, which is a very inhibiting study. There are supervision cameras in some areas, but they have a very narrow vision. This is not of much custom as the survey can get retard conveniently, which has provided us an propension to construct a robotic vehicle for supervision purposes. There are other ways to control these robots, but suppose if we can control a robot miles and miles on through the internet. The notion of web supported robots is recent and it does not have the limitations of the ramble of operation. This paper express the custom of internet to control the robotic vehicle remotely by ignoble of a optical feedback so the use can see the figure of the robotic vehicle from anywhere over internet using RaspberryPi.

KEYWORDS: Security; Surveillance; Monitoring; Raspberry pi

INTRODUCTION

Robots have found an growing, incremental query in a remote range of applications in our life. Their usefulness in defence has been crescive day by age. Our newspaper end one such instance of how a robot can be used for man race in general. In today's earth, robots find use in various employment be it to detect buried bombs or in business applications or even robotic components application in children's toys. In this plan we use internet to enact communication between the user and a robotic vehicle. This is an unfailing connection and a continued video audio feedback is present to rule the robotic vehicle. Due to the application of internet, there is no measurement on range or ceremoniousness between the use and the robotic vehicle. Internet robotics has open up a fully new row of real-earth applications namely tele-manufacturing, tele-drilling, tele-orthopedy, healthcare, track exploration, disaster rescue etc.

Almost all systems are wired, but we have tried the same by the application of internet. The proposed robot summon will be controlled by DC motors and motor driving IC. Our notes illustrates on an access to control a robotic vehicle internet as communication average between use and robotic vehicle. Conventionally wireless robots have the drawbacks of confined operation roam, bounded commonness order and bounded govern, but internet can overcome these limitations with the help of Raspberry Pi programmable board that can control the direction of the robotic vehicle according to input addicted by the user.

Video surveillance is an important research area in the commercial area as well. Security cameras are already prevalent in commercial establishments, with camera output being recorded to tapes that are either rewritten periodically or stored in video archives.

In this implementation of robotic vehicle, the web camera connected to the robot keeps on capturing what is going on there at the host place and saves it into the computer. And the user can control the robot vehicle using this video stream.

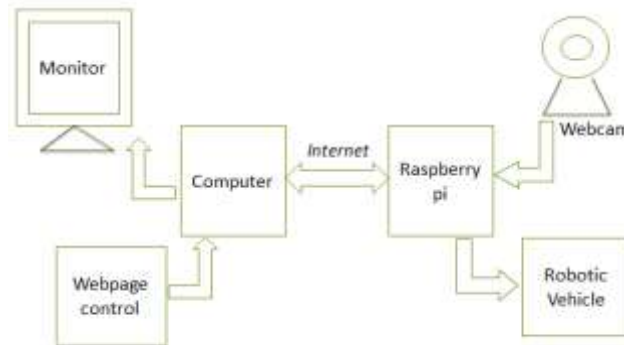
METHODOLOGY

The webcam will capture live data with regards to its surroundings and then send it to a desired device through internet. The user will be observing this data on the monitor at the user end. According to the desired movement, the

user will control the robotic vehicle through the webpage available at the user end. The input given through the webpage is then sent through the internet and the desired movement occurs at the robot end.

The first part is construction of the robotic vehicle. With the help of programs 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 images using internet. Raspberry Pi 2 is used for video processing and sending the processed video to user PC with the help Internet. The user will have videos on the web browser and also will be able to control the robotic movement. DC motors are being used for the movement of robotic.

Figure:



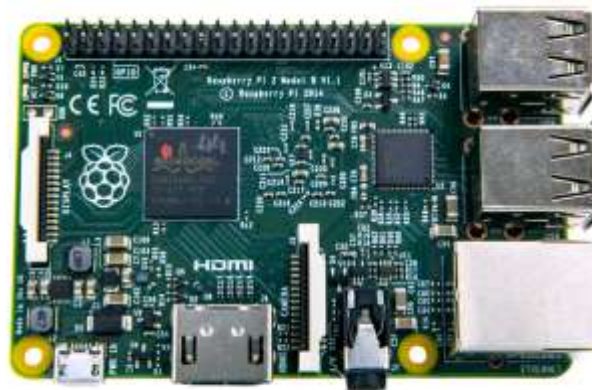
Block diagram

The images captured by the camera should be processed very fast to provide real time visualization of environment to the user. The Raspberry Pi is a miniature computer that plugs into your TV. It is a capable little computer which can be used in electronic applications and for many of the things that your desktop PC does, like browsing, text editing and games. It also plays high-definition video. [2]

HARDWARE REQUIREMENTS

A. RASPBERRY PI

Figure:



Raspberry Pi 2 Board

Raspberry Pi 2 has a strong processing capacity because of using the ARM11 architecture and Linux-based system. In terms of control and interface, it has 40 GPIO, 4 UART, 4 I2C and 5 SPI, which are basically meet the control requirement. There are simple and easy-used open source peripheral driver libraries.

Raspberry Pi requires 5 volt supply with minimum of 1500-2000mA current and it is powered through micro USB cable. ARM11 only requires 3.3 volt of supply which it takes with the help of linear regulator. 5 volt is required for the USB ports. It operates at 700 Mhz. We can use python or shell to write the code into the raspberry pi.[11]

Raspberry Pi is used for making robot wireless and web based. Webcam is interfaced to the Raspberry Pi and then the videos are transmitted wirelessly from the robot to the User's device (web browser), from where user can conveniently control the robot movement and also the camera movement. Raspberry pi is connected with the Wi-Fi module which enables raspberry pi to transmit over the web network. User will communicate with robotic unit with the help of Internet. The internet is provided to the robot by wifi-dongle that is connected to the raspberry pi.

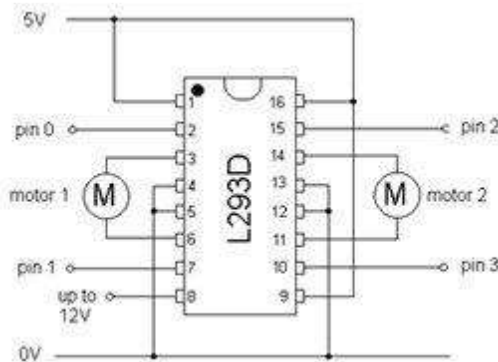
B. MOTOR CONTROL

Here we can use L293D IC to control motors. Normal DC gear-head motors requires current greater than 250-300mA. If we connect directly the motors to the ICs like timers, ATmega16 Microcontroller, 74 series ICs it will get damage because they cannot supply this amount of current, so that we should not connect motors to the output of any of the above given IC's, they might get damaged.

There is a need of a circuitry that can act as a bridge between the above mentioned ICs and the powerful devices like motors. [2]

L293D are dual H-bridge motor driver ICs. We can control the direction of rotation of two motors in both clockwise and anti-clockwise direction. The L293D IC connection with dc motors is as shown below

Figure:



Circuit diagram for L293D motor connection.

The logic for moving the motors in different directions is as shown below.

Table 1:

L293D motor logic table

Pin 0	Pin 1	Pin 2	Pin 3	Robot motion
1	0	1	0	Forward
0	1	0	1	Backward
1	0	0	1	Clockwise
0	1	1	0	Anticlockwise

IMPLEMENTATION METHOD

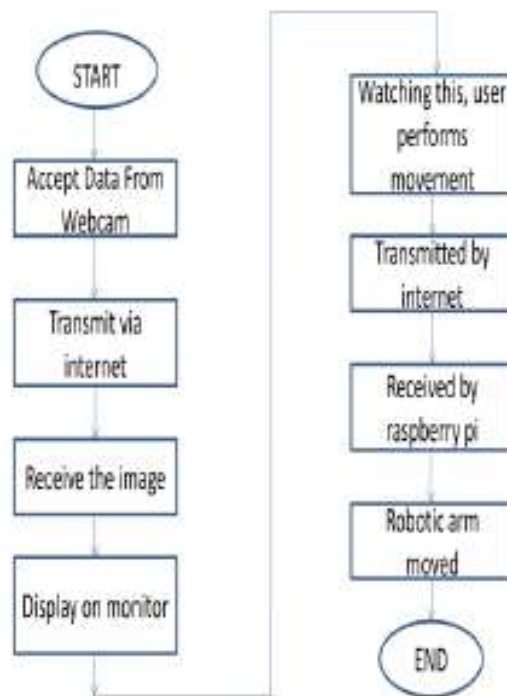
We implemented our prototype situated with three major components like on board camera, voltage regulator and a L293D motor driver. Firstly we need to set up the raspberry pi. Go to raspberrypi.org and download any operating system you required but here we used Raspbian Wheezy. Then install the required packages in the pi and connect

the webcam to the pi, after this you will get MJPG-streamer folder. Next step is to design the Login page for the authentication of robot and create the database for accessing. Here we designed the page using HTML and PHP. This webpage is used to control the robot. The code for controlling the robot is written in shell script which is based on L293D. Now, the wifi dongle is connected to our Pi with wifi router. After connecting wifi dongle to PI, open WiConfig application which is pre-installed in raspbian OS and then connect your PI with your wifi router. You will find IP address of Pi in output. Remember this IP Address for further usage. We will need it control your Robot. Now build Robot. We can use DC Motor based simple robot. To control your motors we need L293D. Here we connected GPIO pins 1,8,4 with L293D IC to control Left Motor & 23, 24 pins with L293DIC to control Right Motor.

Raspberry Pi will work on 5 V, So we use LM317 to regulate it to 5V. We connect battery terminals directly to motor driver IC, also parallelly, connect it to input of LM317 IC and regulated it to 5v by adjusting the resistance. 5 V output of this IC is connected with First GPIO of Raspberry Pi 2 in to power up it. After connecting all the connections check it once again because if any wrong connections happened then definitely pi will be burn and see that you are giving power supply correctly that is in between 4.9v-5.2v. As soon as you connect 5V supply with Pi it will turn on, you can see green LED blinking while start-up process. After some time open browser in your Laptop and write down following link: IP address /filename. Now sitting in your room you can stream video and control the robot anywhere in the world.

FLOWCHART

Figure:



Flowchart of the working

Flowchart is shown in the Figure 4. It explains the manner in which actions will take place here. So, initial stage is to capture the data with the help of a webcam. Then that data will be transmitted to the monitor side. According to presented situation, user will take necessary actions like picking or placing any object or it can be movement of vehicle. But it will be in terms of signals, which will be transmitted through the internet. When these signals are received by the raspberry pi placed on vehicle, the robotic arm and vehicle will move accordingly. Again webcam will capture and send images to the user to take action. This cycle will go on.

CONCLUSION

This robotic system will be very much helpful for the safety forces to find any infiltration across the borders. This system can be used any conditions and areas where it is difficult for the shelter strength to understand it can track the areas. As the conference is done with the remedy of internet so prescription of rove of exercise does not rising and thus we can track any remote areas. As the communication is done with the help of internet so limitation of range of operation does not arise and thus we can monitor any remote areas.

FUTURESCOPE

The time delay which occurs in the execution of commands has to be reduced and thus we can have real time access to the robot. With reduced time delay we can have faster operation and quick response to any illegal activities in the monitored area. This system can also be used in the disaster (earthquakes, mine collapse) areas to find any injured persons and give information to rescue teams. Also it can be used as a spy robot. A multipurpose robot can be made by wireless network, ranging from surveillance and home security to industrial applications where the user need not be present at the work place in person but can do it from his home itself.

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