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Web Controlled Robot for Spying Enemy position In Battleground.

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Abstract - Developing surveillance and monitoring systems can be quite challenging at times, since the systems should be designed with consideration of the environment to be monitored. Good surveillance systems need to have dynamic features, e.g. monitoring cameras. Monitoring such a large area would also be a challenge for the security officers, as they will need to spend too much time to patrol covering all places. To address the challenges like surveillance of a large building with many levels, which would ensure a high cost to install many cameras at many places dynamic surveillance systems include dangerous areas.

1.INTRODUCTION

The Robotic car for keeping eye on enemies consists of Raspberry pi, Motor IC Camera Sensors and GPS. The Raspberry Pi is a card sized computer. It functions almost same as a computer. There are different types of surveillance systems available 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 able to 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 at exact time. Also, another advantage is that it offers privacy on both sides since it is being viewed by only one person. The other big advantage is that, it is an easy and simple circuit for understanding and designing. The operating system used here is Raspbian OS. Raspbian OS has to be installed so that the image can be transmitted to the smartphone Closed circuit television monitoring system has now become an indispensable device in today's society. Robots have found a drastically increasing demand for different range of work in our life. Their use in army and other security sector increases day by day. Our paper includes one such instance of how a robot can be of use to human race in general. In this project, we use the internet to establish communication between the user and a robotic vehicle. This is a dependable connection and a continuous video feedback is available to control the robotic vehicle. Due to the use of the web, there is no limitation on range or distance between the user and the robotic vehicle. It is proposed to address the lower side at cost, efficient, high-speed processing & control hardware for the self-navigating robotics application. Design and Implementation of a Robotic Vehicle with Real-Time Video Feedback Control via Internet/web paper illustrate on an approach to control a robotic vehicle using the internet as the communication medium between the user and robotic vehicle. Raspbian OS has to be installed so that the image and videos can be seen to the smartphone directly. Closed circuit television monitoring system has now become an indispensable device in today's society. There are afferent places such as school, supermarkets, society security where we are having their own CCTV system for 24/7 monitoring.

2. Body of Paper

This is the internet of things (IOT) based project, where we are particularly uses the Raspberry Pi, USB web camera and two DC motor with Robot chassis to build this Robotic car setup. It has a web camera mounted over it, through which we will get live video feed and the interesting part here is that we can control and move this robot from a web browser over the internet. As it can be controlled using webpage, means it can also be controlled by using the other smart devices where we can control through the webpage. We built a webpage in HTML which has Left, Right Forward Backward links, clicking on which we can move the robot in any direction. The project has four Modules:

- Camera Control- Camera can be controlled using following functions:
  - Rotate camera
  - Zoom In / Zoom Out
  - Capture and store image
  - Record and store video
  - Obstacle detection and taking optimum decision

- Location Control-
  Live location of robot is showing on google map and set the movement of the Robot on actual ground.

- Robot Control- Robot controlling can be done by giving instructions like:
  - Move forward and backward
  - Move left and right
  - Speed control

- Fire detection system-
  Sensing flame and triggering alarm for heat sensed.

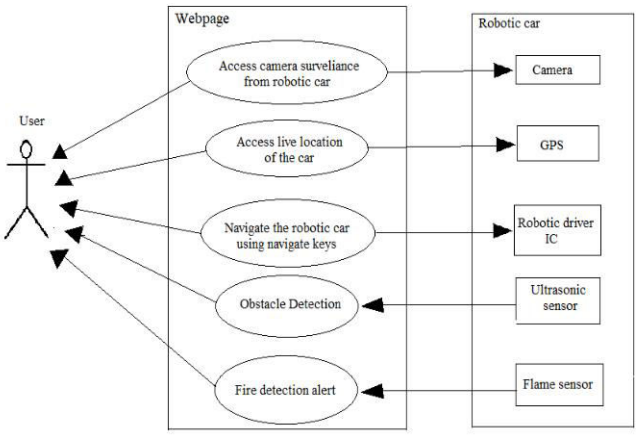

Figure 1: Block Diagram of actual working

2.1. MODELING AND ANALYSIS

2.1.1. Raspberry Pi 3

The Raspberry Pi 3 isn't like your typical machine, in its cheapest form it doesn't have a case, and is simply a credit-card sized electronic board -- of the type you might find inside a PC or laptop but much smaller. The Raspberry Pi 3 is used for making robot wireless and web based.ge Raspberry Pi and then the videos are transmitted wirelessly from the robot to the user's monitor, from where the user can conveniently control the robotic vehicle's movement and also the robotic arm movement. Raspberry pi is connected with the dongle which enables raspberry pi to transmit over the web network. Raspberry-Pi Module Raspberry Pi uses an SD card for booting and for memory as it doesn't have an inbuilt hard disk for storage. Raspberry Pi requires 5 volt supply with minimum of 700- 1000 mA 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 700M Hz. We use python or embedded C to write code into the raspberry pi. It has a strong processing capability due to the ARM11 architecture and Linux-based system.

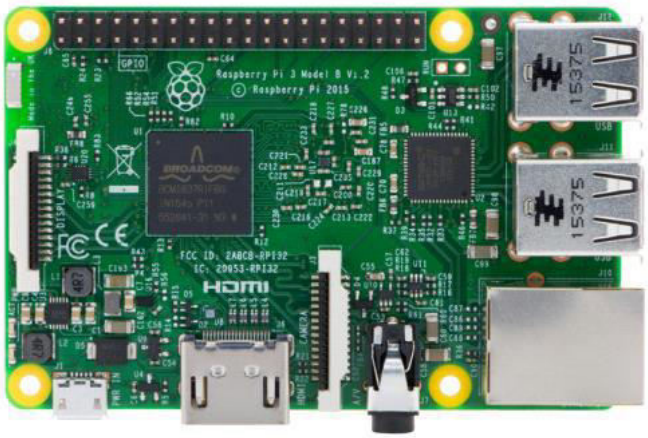

Figure 2: Raspberry Pi 3

2.1.2. MOTOR DRIVER IC L298N

L298N Motor Driver Module is high power motor driver module for driving DC and Stepper Motors. The L298N H-bridge module can be used with motors which have a voltage range of between 5 and 35V DC. With the help of L298N H-bridge module, it is quite easy to control one or two DC motors. First, connect each motor to the A and B connections on the L298N module. Ensure that the polarity of the motors is the same on both inputs if you are using two motors for a robot or anything. Otherwise, you may need to exchange them over when both motors are set to forward and one goes backward. Next, connect the power supply to pin number 4 on the L298N module and negative/GND to pin number 5 of the L298N module.

In this project, we have two DC motors, therefore digital pins D9, D8, D7 and D6 will be connected to pins IN1, IN2, IN3 and IN4 respectively. Then connect D10 to pin number 7 on the module (remove the jumper first) and D5 to pin number 5 of the module. The direction of the DC motor is controlled by sending a HIGH or LOW signal to the drive for each of the motors.

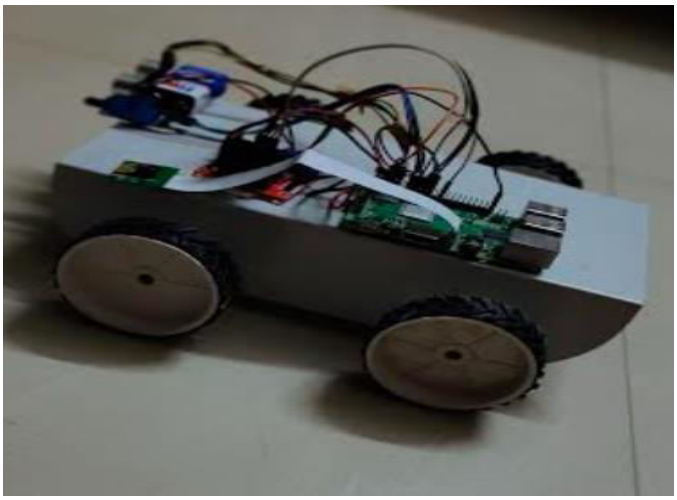

Figure 3: 3D view of Robot

2.1.3 VNC Viewer

Virtual Network Computing (VNC) is a graphical desktop-sharing system that uses the Remote Frame Buffer protocol (RFB) to remotely control another computer.. An application called VNC Viewer must be running on the client computer; that is, on the computer you are sitting in front of, and want to exercise control from. It is a cross-platform screen sharing system that was created to remotely control another computer. This can include another computer, a tablet, or a mobile phone. When the server and viewer are connected, the server transmits a copy of the remote computer's screen to the viewer. Not only can the remote user see everything on the remote computer's screen, but the program also allows for keyboard and mouse commands to work on the remote computer from afar, so the connected user has full control.

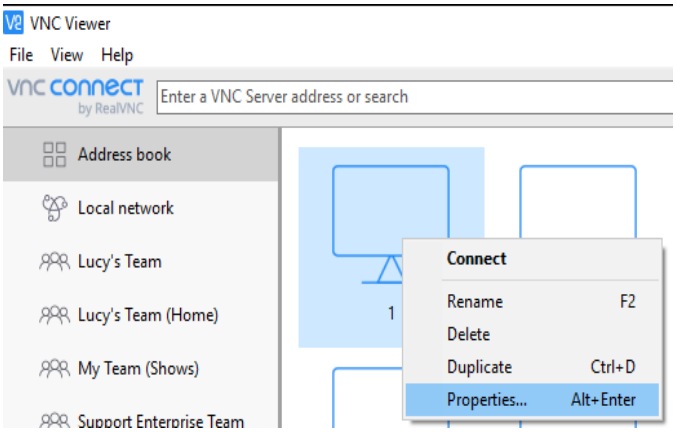

Figure 4: VNC Viewer

2.2. RESULTS AND DISCUSSION

Robotic car consists of a web camera, flame sensor, GPS tracker, ultrasonic sensor and robotic driver IC. The real time video and control are displayed in the webpage and also get stored in the system from where we are controlling it using internet or within the Wi-Fi range and one can control it using those control provided Here we are using raspbian OS. Install the required packages in the pi using suitable commands in terminal window and connect the pi cam to slot beside the Ethernet port. Now design the control page that provides a way to control our robot this page is designed HTML and python and write the controlling of the robot code based on the L293N IC logic we have used. Connect to a network through on board Wi-Fi .Once it is connected through putty software configure we got the IP address we can use it for controlling purpose.

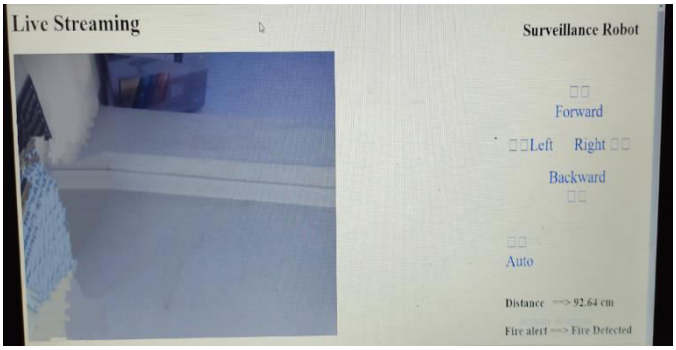

Figure5 Webpage

Webpage is showing Live Streaming of Surveillance Robot. It is recording the videos also. We can move robotic car by using navigation buttons. Webpage consist five functional keys for the purpose of robot control and it also showing measured distance between robotic car and obstacle along with fire alert system.

3. CONCLUSIONS

In this project we have developed a Robotic Car which can keep watch on enemies, record their activities and gives an alert of it. We can monitor any remote area where human's presence is not possible. One can easily monitor as well as control the activity of the robotic unit.

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