

Mobile Surveillance Robot

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Abstract- In this paper we present a wireless surveillance robot system for monitoring purpose. We explain how to design and implement wireless robot which will enable us to control the robot with the help of internet and it will be able to detect the obstacles or bodies with the help of sensor. It will help in rescue operation and user can access the video transmitted from the remote area such as the sensitive areas or areas which are beyond our reach. Camera movement is controlled through mobile at the user interface thus supplying user with enhanced view of the particular place.

Keywords- Internet, Raspberry Pi 3, Pi Camera, Servo Motor, Robot.

I. INTRODUCTION

Robots are becoming more and more advanced as technology increment in the areas of CPU speed, sensors, memories etc. And there is ever requiring applications even in safety. With the rapid growth of the Internet, more and more advanced devices or sensors have been embedded into it for performing the desired work, distributed computer systems, surveillance cameras, telescopes and manipulators. Although the execution of Internet robotics is relatively new and still in its early stage, it has accumulated the huge interest of many researchers in the world.

Mobile surveillance is an important research area in the profitable sector as well. Technology has reached a stage where mounting cameras to capture video imagery is cheap, but finding available human resources to sit and watch that image expensive. Surveillance cameras are already prevalent in commercial establishments, with camera output being recorded to tapes that are either rewritten periodically or stored in video archives.

We have developed a robot which can be used for monitoring purpose and controlled from any place through GUI interface. The control mechanism is gave along with video transmission facility. The video transmission is practically achieved through high-speed image transmission.

Initially, the robot will be furnished with a Camera which capture the image in front of it will transfer the images to the server on which the user will be observing the live feed.

II. LITERATURE REVIEW

1. .KunalBorker, Rohan Gaikwad, Ajay Singh Rajput the paper draws a robot names as wireless controlled surveillance robot. This paper represent a wireless controlled robot system for surveillance purpose. A robot is a machine capable of carrying out a complex series of actions automatically, especially one programmable by a computer. In such type of applications wireless communication is more important. This paper also shows general idea and design of the robot.
2. TusharMaheshwaril, Upendra Kumar, ChaitanyaNagpae, ChandrakantOjha and V. K. Mittal [4] Spy-Robot which are controlled Wireless can be truly useful if they can be controlled remotely over a long distance operating ranges. Availability of multiple procedures for their wireless control operation can be improvised their capabilities and the range of applications. The paper enroots a prototype watcher that can be controlled remotely, using multiple techniques. The spy-robot can be inhabited using a smart phone based DTMF, distantly control application, audio commands and constantly changing gesture control function. DTMF uses alpha-numeric keypad of mobile phone. The remote function is developed for the Android platform based smart phone.
3. Rui Chen, Rong Liu, Jifan Chen and Jin Zhang [5]. The paper shows the design, analysis and forgery of a quadruped wallclimbing robot. Inspired by the climbing bearing of geckos, the robot has genetics similar to a gecko's motion. Geckos stick on the wall surface with force, the robot is based on electrostatic adhesion force induced by a specially designed electrostatic adhesive footpad. By adding the bionic bearing design of the gecko and unique assets of electrostatic adhesion mechanism, the robot has profit of light weight, low power consumption, flexible movement and high versatility to different wall surfaces. Climbing practice on the surface of a high-rise glass window are exhibited, and the robot

achieve the straight climbing and turning robustly and agilely.

4. Deepika R ,Prathyusha K ,Amulya P [6] The paper shows the framework on vision based interface that has designed to instruct a humanistic robot through gestures using image processing. Image predefining and blob detection techniques are used to obtain sign language. Then we evaluating the images to recognize the gesture given by the user in front of a web camera and take relevant movements (like clicking picture, moving bot etc). The application is developed using Open CV libraries and Microsoft Visual C++. The movements obtained by processing the live images are used to command a humanistic robot with simple capabilities. A commercial robotic human toy robot Robosapien was used as the o/p module of the system. The robot was consolidate to computer by USB-UIRT (Universal Infrared Receiver and Transmitter) module.
5. Osumi H, Yokohama K, Takeuchi K, Nakamura R [7] This paper, first a method using force redundancy of the robot is been proposed for the purpose of speeding Surveillance Robot. Then, an algorithm for getting the fastest walking pattern in a trot gait specific time span is developed by combining the result of the collateral legs and that of the waving legs. The obtained walking stencils is installed in a quadruped robot SONY ERS-7 and its performance is varied by experiments.

III. PROPOSED SYSTEM

Presently, the wired system’s biggest limitation is its cost. Not everyone can pay for this cause wired systems are costly and they also need professional installation. Because of this, only rich families can afford the installation of these wired security systems. Also, wired systems are not very flexible because they require professional installation. The wires need to run from the control panel to all the sensors. This can be hard if the building was not prewired to contribute a home security system.

One of the major limitation of the wireless systems is that they require the often replacement of batteries. They can be harmful to electromagnetic interference in some particular place. As for their safety cameras, the wireless systems fall short, hence the cameras run on batteries. The batteries are not last for an whole day and would require to be charged or change the place often.

So we develop proposed system to eliminate the drawbacks of both wired and wireless systems. The proposed

system will contain a one unit, which will observe the home for different insecure conditions and provide video feedback via a mobile interface.



Fig 1. Mobile Surveillance Car

IV. WORKING OF SYSTEM

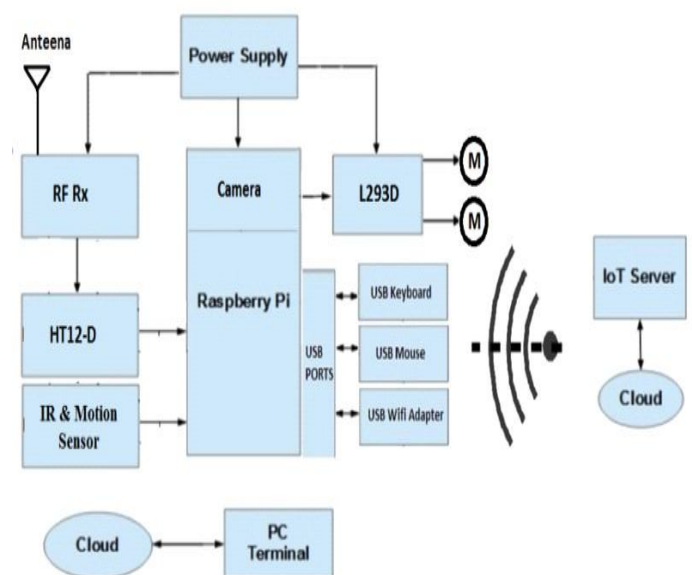


Fig2. Circuit Diagram of Mobile Surveillance Robot

The brain of the circuit is raspberry pi. It is single board credit card size computer. It consist of two IR Obstacle Sensors that allow it to see the obstacles that you can’t see directly, because you are not present there. It will detect an obstacle and if the obstacle detected, it will change its direction. As stated before, the robot has quite a few sensors on board. However, apart from that, it also has a camera which can be used for surveillance of human being. We have also used the motion sensor to detect human being movement if a human is detected system will enable camera module. It also has an L293 Motor driver circuit to allow sufficient current to

power the motors via the Raspberry pi GPIO. IoT server controlled robot from a remote place.

In order to control the robot from Internet, we have written a python script which will read continuously, and do necessary movement according to the input received from the mobile. We are using 6 Tab in our GUI (Graphical User Interface) forward, backward, right, left, stop and camera. When the user gives a particular input from the mobile, it will be stored in a text file on the server, at the robot end python script is running continuously which will read that text file and make movement decision according to user input. Raspberry pi will give output to L293D which will be used for controlling direction of motor. Hence when the user clicks on the forward button, the robot movement done in forward direction. Let's say if the user strike the right button, in this case, only one motor (back-left motor) will be enabled and the robot will move in the right direction.

In order to turn on camera user will have to click on switch on button provided in graphical user interface. Once camera gets switch on, user can see the front view from robot by pressing the camera button. The user can perceive the front view of the camera from anywhere just user required to have connected to the Internet.

V. ACKNOWLEDGEMENT

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VI. CONCLUSION

Thus we have designed a web surveillance system capable of recording/capturing video/image and transmitting to a personal computer. It is advantageous as it offers reliability and privacy on both sides and also eliminate the drawback of previous system. Using this robotic system a far location can be observed easily from remote terminal. One can easily observe as well as capacity to control the behavior of the robotic unit.

Important action can be taken in very less time span in the case of emergency conditions such as elderly person falling sick, military areas, smart homes, offices, industries etc. This robot is also have the capability to recognize victims in front of the it. The sensor system is very lean. For future task, we will improve this system for flying robotics system.

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