CONTROLLING A RASPBERRYPI ROVER USING A WEB BROWSER VIA LAN \ INTERNET

S. SAI CHANDANA,D. SAI SPANDANA,CH. SRI KRISHNA, Y. DELPHIN DEBORAH

ECE DEPT, SRM UNIVERSITY

ABSTRACT:

This project is to Build and interface a real time wheeled mobile robot or a drone where camera and an arm is installed in it . Controlling and monitoring of robot is done using internet even if it is in the isolated place. Software system can be built in three various programming languages and controlled via the internet using webpage protected with a username and password to make sure it cannot be hacked and can access through the internet by any web browser such as Mozilla Firefox. The mobile robot system is used to transfer foreign objects and access to areas that are unable to be accessed by humans .The development of this robot is based on Arduino Mega platform which will be interfaced with the microcomputer that is placed on the robot running as a server.

Introduction

Today robotics and automation rules the world in many domains like Space Research, Military applications, Automobile Engineering, Medical Electronics, Industrial and Home Automations etc,. Here's the part of robotics in the form of rover which are beneficial to engineering and society and then explores how robots have been used in recent research programs. Engineers have demonstrated that there are many benefits to using robots at specific times instead of humans. In an industrial sense, robots can

perform complex, and sometimes tedious, jobs more efficiently and effectively than humans. In fact, robots never get tired or bored and, if properly maintained, never get sick or need a break. Imagine person working in a factory and welding the same joint or tightening the same screws a thousand times every day?

An added bonus to using robots it that they can be used in even more exciting and dangerous environments in place of humans. This includes exploring the insides of volcanoes and caves, the depths of vast oceans, and even outer space and other planets! Also, robots can help in emergency situations: they can enter a building or structure to disable a bomb or verify damage or loss due to a natural disaster. Equipped with cameras, microscopes and various tools, robots can very effectively identify minerals and collect specimens.

In this experiment, prototype of a robotic rover controlled by wireless sensor network under linux platform using smart devices and Embedded system hardware. In domestic side the robots are employed only for detecting the human motion in the area and in capturing the motion and storing it in the database but in the defense side the robots are used for capturing the live motion and sending the live motion to the control room and capturing the person in the field.

In this project Raspberry pi platform is used for making the robot, the robot which are we designing captures the live motion and the position of the live human using the camera and sends the live video and the position to the control room via wireless communication technique.

Methodology:

- In this project, the robotic rover is implemented using the single board computer which consist of Quad core ARM cortex-A7 based SoC capable of booting linux kernel, Raspberry pi is a credit card sized computer. It functions almost as a computer. There are various surveillance systems 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 view what is happening in that place

- Whereas, here even if the user is moving from one place to another place they can keep track of what is happening in that particular place. In traditional security systems, monitoring devices are usually mounted on fixed locations.

- In our proposed system video can captured and processed by open computer vision library package which is installed in raspberry pi. The captured video can send to the smart device through the wifi. The smart device should support a wifi protocol and also the captured image stored in the Raspberry pi-2's hard disk(Micro SD card)

- The following figure shows (controller part) smart environment which may be a smart phone installed with the specific application that produces control signals in the form of ASCII Characters transmitted to the micro controller unit available in the robotic rover using wifi.

We may use the proposed robotic system which will go into those areas and provide us with the videos of those locations. When someone enters such secured places, the PIR sensor senses it and immediately it will send the indication to the user through wireless communication and is indicated to the user through alarm. Meanwhile, the camera mounted on the robot will keep on capturing the videos from the surrounding to keep a record of the details of the incident happened and this is readily available to the user. The other major advantage is that is a simple circuit. The operating system used here is Raspbian OS.

Result:

In this project the robotic rover controlled by wireless sensor network under linux platform using smart devices and Embedded system hardware. In domestic side the robots are employed only for detecting the human motion in the area and in capturing the motion and storing it in the database but in the defense side the robots are used for capturing the live motion and sending the live motion to the control room and capturing the person in the field. Raspberry pi platform is used for making the robot, the robot which are we designing captures the live motion and the position of the live human using the camera and sends the live video and the position to the control room via wireless communication technique.

Conclusion:

In this paper, the design and development of the domestic side robots are employed only for detecting the human motion in the area and in capturing the motion and storing it in the database but in the defense side the robots are used for capturing the live motion and sending the live motion to the control room and capturing the person in the field. Raspberry pi platform is used for making the robot, the robot which are we designing captures the live motion and the position of the live human using the camera and sends the live video and the position to the control room via wireless communication technique.

Reference:

1) WiFiPi-Tracking at mass events Patil, P.H.; Kokil, A.A. Pervasive Computing (ICPC), 2015 International Conference on Year: 2015

2) Kinematic modeling of a six-wheeled robotic rover with a passive/active suspension Jianguo Tao; Fei Yang; Zongquan Deng; Haitao FangIntelligent Control and Automation (WCICA), 2011 9th World Congress on Year: 2011

3) The Kapvik Robotic Mast: An Innovative Onboard Robotic Arm for Planetary Exploration Rovers Guangjun Liu; Yugang Liu; Hongwei Zhang; Xiaohui Gao; Jing Yuan; Wanping Zheng Robotics & Automation Magazine, IEEE Year: 2015, Volume: 22, Issue: 1

4) Design and construction of a mobile type rover robotics platformCastaneda, G.E.; Monroy, D.J.; Aponte, J.A.; Aviles, O.F.Robotics Symposium, 2011 IEEE IX Latin American and IEEE Colombian Conference on Automatic Control and Industry Applications (LARC) Year: 2011

5) Hierarchical Navigation Architecture and Robotic Arm Controller for a Sample Return Rover Dimitrov, V.; DeDonato, M.; Panzica, A.; Zutshi, S.; Wills, M.; Padir, T. Systems, Man, and Cybernetics (SMC), 2013 IEEE International Conference on Year: 2013

6) Orthogonal-view based compressive motion classification using pyroelectric infrared sensors Qiuju Guan; Xuguang Yin; Xuemei Guo; Guoli Wang; Xiaomu Luo Signal Processing (ICSP), 2014 12th International Conference on Year: 2014

7) Surveillance Tracking System Using Passive Infrared Motion Sensors in Wireless Sensor Network Byunghun Song; Haksoo Choi; Hyung Su Lee Information Networking, 2008. ICOIN 2008. International Conference on Year: 2008

8) Target Detection and Classification Using Seismic and PIR SensorsXin Jin; Sarkar, S.; Ray, A.; Gupta, S.; Damarla, T. Sensors Journal, IEEE Year: 2012, Volume: 12, Issue: 6

9) PIR-sensor based human motion event classificationUrfaliglu, O.; Soyer, E.B.; Toreyin, B.U.; Cetin, A.E.Signal Processing, Communication and Applications Conference, 2008. SIU 2008. IEEE 16th Year: 2008