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Review on Surveillance Robot using Raspberry Pi and IoT

Alan Shaji[1], Anand K Das[2], Harigovind P S[3], Amrit Ashok[4], Shahul Hameed A[5]

[1,2,3,4] UG Scholar, Department of Electronics and Communication Engineering, Dr. APJ Abdul Kalam Technological University Kerala, India
[5]Assisstant Professor, Department of Electronics and Communication Engineering, Dr. APJ Abdul Kalam Technological University Kerala, India

ABSTRACT

Remote monitoring and monitoring of our homes has seen a growing need in emerging times. Through this article, we would like to offer a surveillance robot that can be integrated into any type of home. The basic controller for the bot will be a Raspberry Pi 3 Model B. A webcam attached to the Pi monitors the area and sends notifications when an intrusion or intrusion is detected. The camera also has a facial recognition algorithm that will be able to identify the person responsible for triggering the motion. If it's an authorized employee, the in-car voice assistant will start talking to that person. The notification will be sent only when it is unauthorized person and will contain the clicked images of the intruder and also trigger the webcam's live stream. The Pi's live streaming capabilities allow camera feeds to be analyzed from anywhere via the Internet. With such a system, each user will feel safer away from their home or leaving their children and elders alone at home.

INTRODUCTION

Traditionally, monitoring systems are installed in all important safety areas. These systems often include high quality cameras, multiple computers for tracking, hosting these videos and many security officers to monitor these videos. When taken together, these systems can create a large complexity during the installation as well as maintenance. The observation camera line is only visible in some places and also has a limited range in which they can be displayed. Above all, the cost of implementing these systems is so high that they cannot be installed in every household. Traditional systems require continuous monitoring by some dedicated personnel cannot be available in each household. Hiring an anonymous person to do so will also cause security issues.

Video surveillance cameras installed these days also have a limited vision because they are fixed modules. If an intruder moves out of the school overlooking the CCTV, he cannot track or track his movements. The solution to all the above problems is that the monitoring robot can monitor the areas installed and send a notice to the owner when the intrusion occurs. It also allows users to connect to the webcam Raspberry Pi of any distance location and show the direct foods of everything that happens on its campus. The robot's cost-effectiveness and remote control feature enables easy operation by any user.

LITERATURE SURVEY

R. Karthikeyan, S. Karthik, Prasanna Vishal, S. Vignesh [1] The Paper draws a robot called snitch that is able to climb walls using microscopic suction cups, it uses the raspberry pi processor to manage the robot via WiFi network for better processing and data transport. Interruption Robots are suitable for military applications such as tracking people or places of interest, providing a dexterous advantage in hostile terrain or in undesirable situations. KunWangZhiqiangWang and Houxiang Zhang [2] It tests the movement mechanism and crawling gait of our flexible wall-climbing caterpillar robot.

The flexible climbing caterpillar robot is inspired by the genetics of the coherent caterpillar. Two different types of modules are used, the connection module and the generic module, which have been developed. Due to predefined constraints between the inhaler cup and the wall, the motion of the moth robot involved in an altered genome varied from an open to a closed group and then to an ordered open group.

Elliott, M., Morris, W., Jizhong Xiao [3] The design achieves both rapid movement of individual modules across uninterrupted surfaces and smooth progression between pre-existing surfaces. The video also shows eloquent

simulation results of aerodynamic trends to optimize the design. The DSP-based control system introduced in the Supervisor Robot uses RaspberryPi technology to start the robot to operate both manually and automatically.

Tushar Maheshwaril, Upendra Kumar, Chaitanya Nagpae, Chandrakant Ojha and V. K. Mitta15 [4] SpyRobot is wirelessly controlled that can be really useful if they can be remotely controlled on a long distance range. The availability of many procedures for their wireless controls can be improved for their ability and application range. Paper loped a prototype can be remote control, using many techniques. Spyrobot can be lived using DTMF DTMF based on smartphones, remote control applications, audio controls and constant changing gesture control functions. DTMF uses keyboard and numbers on mobile phones. The remote control function is developed for smartphones based on Android platform.

Rui Chen, Rong Liu, Jifan Chen and Jin Zhang [5] The paper shows the design, analysis and fabrication of a four-legged climbing robot. Inspired by the gecko's ability to climb, the robot has genetics similar to the way geckos move. The gecko clings to the wall surface by force, the robot is based on the electrostatic adhesion force created by the specially designed electrostatic glue.

By complementing the gecko's biological bearing design and the unique strength of the electrostatic grip mechanism, the robot has light weight, low power consumption, flexible movement and excellent flexibility on surfaces. different wall surfaces. Climbing activities on high-rise window surfaces are displayed and the robot can climb and turn in a straight line with firmness and agility.

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 toy robot Robosapien is used as the o/p module of the system. The robot is unified on the computer using the USB-UIRT (Universal Infrared Transmitter and Receiver) module.

Osumi H, Yokohama K, Takeuchi K, Nakamura R [7] In this paper, first, a method of using excess force of the robot is proposed with the aim of speeding up the setting of auxiliary pins with constraints imposed by ZMP, the connection limit of the actuator and the limit of frictional force available. Then, an algorithm to get the fastest gait in a specific time period at trot speed is developed by combining the results of the collateral leg and the non-resting leg. The resulting walking stencils were fitted to the SONY ERS7 quadruped robot and its performance varied according to the experiments.

S.Wu, M. Li, S. Xiao [8] This paper proposes a wireless distributed wall climbing robot system for exploration. First, it presents the work of distributed electronic ascent system. The single suction cup mother climbing robot has a two-wheel drive system that allows for quick movement and can adapt to almost any type of vertical wall surface in intermittent environments.

Children's climbing robot is a civilized worm-like mechanical structure with the advantages of compact size and light weight, allowing the robot to rotate from surface to surface and can avoid the ' Exposed. Second, a built-in climbing robot system is designed. With Libttery power and wireless transmission, the robots are large enough to explore the world semi-autonomously.

AkioY, Takumi N, Toshiro H [9] Electrostatic adhesion is highly appreciated for the robot's ability to climb walls. To realize electrostatic adhesion to the wall, tunable electrodes were fabricated using a plastic film and conductive foil. Wall adhesion performance can be measured for both conductive and non-conductive areas.

The results for a continuous surface show that the tunable electrodes can act like a suction cup and that the attraction of air and the electrostatic force can contribute to adhesion to the wall. A robotic prototype using adjustable electrodes has been built, which can successfully climb a conductive wall at a speed of 6.6 mm/s.

M Fujita [10] We describe the impact of human interventions on microrobots in this article, along with AIBO. First, we describe a design concept for AIBO based on how a "natural" look can be enhanced. Statistical results of marketing and practice related to human-robot interaction using AIBO, we show that mini-robots have full human emotions. In addition, experiments confirm that AIBO helps with human-to-human communication. We discuss the anomalies of interactions with AIBO and try to explain why it happens.

SYSTEM OVERVIEW

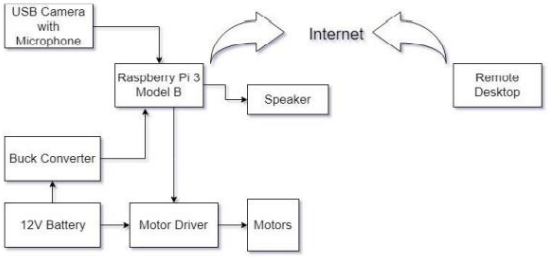

Figure 1. Block Diagram of Proposed System

The main components of the system are:

Raspberry Pi 3 Model B

Figure 2. Raspberry Pi 3 Model B

USB Camera

Figure 3. Logitech C270

Motor Driver

Figure 4. L298N Motor driver

Battery

Figure 5. 12v Lead Acid battery

Buck Converter

Figure 6. LM2596 Buck Converter

Motors

Figure 7. DC motor

CONCLUSION

The advantage of installing such a system in every home is that it gives peace of mind to the users at their premises even when they are not at home. The low energy consumption of this system allows it to be easily installed in any type of home. It can also be used for a long time by using a suitable battery. This will allow the system to function properly for a whole week. Even if a security camera is already installed, this system can be added for added security. Users will be able to keep an eye on their loved ones at home, even when they are busy working elsewhere. It ensures the safety of the elderly and children if they are alone at home.

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