Surveillance Robot

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Abstract: - **This system gives the details of the robot surveillance system which can be used for the security purpose in various fields. As security has become the major issue in every field there are many existing systems that does not meet the requirement of the people like CC TV and remote controlled robots. Our proposed system can be controlled at wide range distance using android mobile application and can stream live videos and capture pictures when required. Ultrasonic sensor is used to detect the obstacle, capture and send to the user. Here we use WIFI to connect robot to android application.**

Keywords :- **Camera, Ultrasonic Sensor, Raspberry pi 3, Mobile application, WI-FI.**

I. INTRODUCTION

Now a days' security has become the most important objective of people in every field. So the demand for security system has been rapidly increased which reduces the human effort. The project is designed to build a robot that captures the images in the real time and video for surveillance. The robot is built using raspberry pi 3, ultrasonic sensor to detect the obstacle and a camera is used. Here we have developed a application on mobile device it runs on android operating system which controls the robot. Here we connect the robot and the application using WIFI that enables fast transmission of data.

II. EXISTING SYSTEM

In existing systems the robots are designed to move in the pre defined paths which are not capable in obstacle detecting and capturing the images [1]. In some systems power is supplied through wires they cover less area of surveillance and have less amount of storage which requires timely management of the storage [2].

III. PROPOSED SYSTEM

The proposed system aims in movement of the robot in all four directions with the help of the android application installed in the android device. Here power is supplied through USB power supply or batteries which makes the robot to move independently and provides efficient battery backup. Here we can store the data in mobile storage directly this helps to save storage space in robot. WI-FI is being used to connect the robot and android

application which helps in controlling the robot at wide range distance.

Robot captures images when the obstacles is d we use ultrasonic sensor to detect the obstacles. Ultrasonic sensor will generate high frequency sound waves When these sound strike obstacle echo is received back to the sensor. Transmitting and receiving the times of the sound waves are sent to the Raspberry Pi 3 generates a signal to capture the obstacle.

The system consists of two parts:
1. Robot part.
2. Controlling part
   1. Robot part:

Robot part consists of raspberry pi 3, ultrasonic sensor, power module, motor module, web camera.
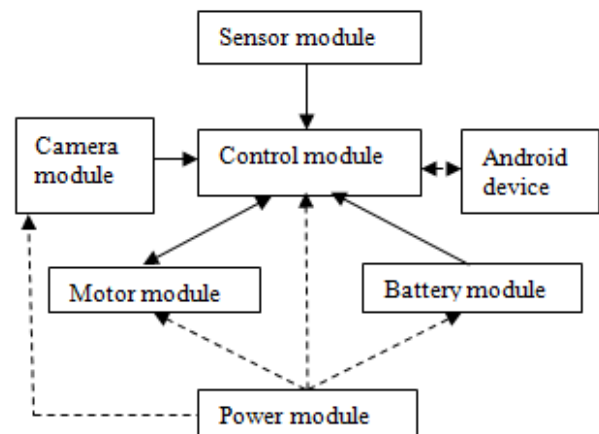

Figure 1: Data flow diagram

a. Raspberry pi 3:

Raspberry pi 3 connected with WIFI, web camera and ultrasonic sensor. Web camera captures pictures and lives stream videos which are accessed else viewed by entering raspberry pi IP address in the mobile application which is connected through WIFI.

b.Ultrasonic sensor:

Ultrasonic sensors help in detecting the obstacle within the range of 4 meters and capture it. Ultrasonic sensors generates high frequency sound waves when the sound waves strike the obstacle the echo is received back to the sensor and sent to raspberry pi 3 where web camera captures the image based on the detection.

c. power module:

To ensure that every module in the robot except the android device, we need to charge DC voltages. The sensors, camera, and control modules all require voltage of 4.5V. This voltage can be provided using 4 rechargeable batteries. The batteries connected in series provide a voltage of about 4.8V when fully charge and 4.3 when fully discharged.
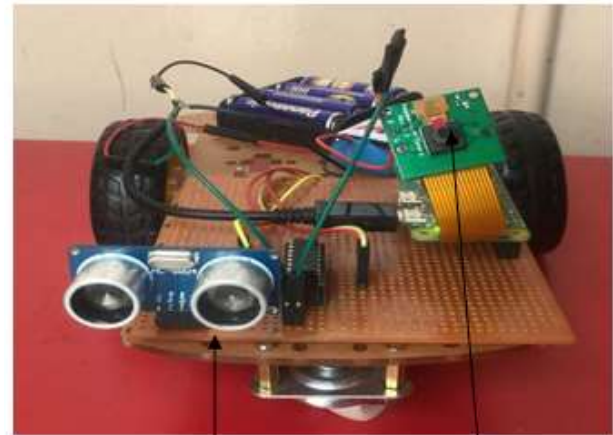
c. Motor module: Here we connect DC motor to Raspberry pi 3 and control it by making it move forward, backward, right, left.

d. Web camera:

Web camera which is of 5MP is connected to raspberry pi which captures and streams live video.

ii .controlling part:

The robot is connected to android application by entering the IP address of the raspberry pi 3 in the application through   WI-FI. The robot is controlled using the mobile application which consists of several navigation buttons. The movement of the robot can be done using the left, right, front, back buttons and there are also capture buttons and download button to capture and download when required. There is a display area to stream the live video from the robot.

Figure 2: Front view of Robot

Figure 3: Top view of Robot

Figure 4: snapshot of android app to control robot

IV. CONCLUSION

Here we conclude that the surveillance robot can be used for security purpose in industries, homes, in agriculture lands to monitor the fields and security purpose, in military to monitor the border areas, to surveillance the disaster affected areas where a person cannot reach. Here we can stream live video and capture the pictures.

V. FUTURE WORK

Operate the robot throughout the world with the help of servers in real time. We can design self-propelled patrolling robots which move periodically without android application to control the robot.

REFERENCES

1. Hou-Tsan Lee, Wei-Chuan Lin, Ching-Hsiang Huang, Yu-Jhih Huang, "wireless indoor surveillance robot", SICE annual conference 2011.pp

2. Geon-Woo Kim, Jong-Wook Han, "security model for video surveillance system", in 2012,pp.100-104.

3. Jung-Hyun Park Kwee Bo Sim , Dept. of Electr. & Electron. Eng., ChungAng Univ., Seoul, "A design of mobile robot based on Network Camera and sound source localization for intelligent surveillance system", ICCAS 2008, p674, Oct. 2008.Introduction to the RFID,

4. Yang Xiao Yanping Zhang, Dept. of Comput. Sci., Univ. of Alabama, Tuscaloosa, AL, USA, "Surveillance and Tracking System with Collaboration of Robots, Sensor Nodes, and RFID Tags", ICCCN 2009, p1 , Aug. 2009.

5. Basic Concept of Android System, Kyunghoon Kim Soonil Bae Kwanghak Huh ,Robot Bus. Group, Samsung Techwin in Seongnam, South Korea, "Intelligent surveillance and security robot systems", IEEE ARSO 2010, p70, Oct. 2010Android Socket[1]

6. Meng-Shiun Yu Horng Wu Huei-Yung Lin, Dept. of Electr. Eng., Nat. Chung Cheng Univ., Chiayi, Taiwan, "A visual surveillance system for mobile