Spy Robot app to Rescue people

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Abstract— In this paper, a new approach for detecting alive humans in destructed environments using a autonomous robot is proposed. Alive human body detection system proposed a monitoring system using PIR Sensor. In order to detect a human body, an autonomous robot must be equipped with a specific set of sensors that provide information about the presence of a person in the environment around. This work describes an autonomous robot for rescue operations. A PIR or a Passive Infrared Sensor can be used to detect presence of human beings in its proximity. The proposed system uses an ultrasonic sensor in order to detect obstacles which help to operate the robot to turn. The detection depending on a number of factors such as the body position and the human heat. The whole system can be operated using an android app. The Bluetooth attached with the robot helps to interact with the mobile. This way, the real-time cost of processing and data transmission is considerably reduced. This system has the potential to achieve high performance in detecting alive humans in devastated environments relatively quickly and cost-effectively.

Keywords— Motion detection, Robotics, ultrasonic sensor, PIR Sensor, Bluetooth, and Rescue.

I. INTRODUCTION

This article design a mobile rescue robot system based on wireless sensor network technology to help the people on time which are trapped in terrorist attacks, earthquake etc. It gives timely & accurately reflect dynamic situation of human in disaster region like in the underground regions to controller who operate this app. This paper mainly focuses to detect people for rescue in a building by sending spy robot which gets operated using android app. The app helps to move robot to forward, backward, left and right. The Bluetooth attached with the robot helps to interact with the mobile. By pressing the button, the value sends to the robot and as per the value, the robot get operated.

The PIR sensor placed in the robot helps to sense the human movement. As soon as the sensor senses the human movement, it sends signal to the mobile. The application installed in the mobile will give alert of presence of human. The concept will be more helpful in border to detect the place of presence of scientist in a simpler manner[1][2].

II. PROPOSED SYSTEM HARDWARE

The objective of the project is to detect terrorist in a building by sending spy robot which get operated using android app. The app helps to move robot to forward, backward, left and right. The Bluetooth attached with the robot helps to interact with the mobile. By pressing the button, the value sends to the robot and as per the value, the robot get operated.

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The mobile rescue robot consists of four units that are namely Sensor unit, Micro-controller, Motor driver unit, Transmission unit. The sensor unit must be directly interfaced to the micro-controller. The sensor devices Monitor current readings and sends data to the Micro-controller. The controller circuit is responsible for transmitting this information. The robot driver unit is primarily concerned about the movement of the robot in x-axis and y-axis. In transmission module, the Bluetooth module is mainly used to transmit the data when the person is found.

Microcontroller unit: The high-performance Microchip 8-bit AVR RISC-based microcontroller combines 32KB ISP flash memory with read-while-write capabilities, 1KB EEPROM, 2KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operates between 1.8-5.5 volts[3].

Sensor Unit: The PIR sensor used to detect the movement of human being within a certain range of the sensor is called as PIR sensor or passive infrared sensor (approximately have an average value of 10m, but 5m to 12m is the actual detection range of the sensor. The module actually consists of a Pyroelectric sensor which generates energy when exposed to heat. It will detect a movement because the human body emits heat energy in a form of infrared radiation. An Ultrasonic sensor is a device that can measure the distance to an object by using sound waves. It measures distance by sending out a sound wave at a specific frequency and listening for that sound wave to bounce back. By recording the elapsed time between the sound wave being generated and the sound wave bouncing back, it is possible to calculate the distance between the sonar sensor and the object[4].

Robot driver unit: The robot driver unit is primarily concerned about the movement of the robot in x-axis and y-axis. Two DC motors of 200rpm will run the wheels of mobile rescue robot. When both the wheels are given with positive pulse edge, then robot will moves in forward direction. when the supply is reversed mean both the wheels are given with negative pulse edge, then it goes in backward direction and similarly by varying the negative and positive edge, left and right turn can be achieve successfully. This will drive the robot to move in forward, reverse and turn left and right[5][6].

Transmission unit: The Bluetooth module is mainly used to transmit the data when the person is found. .HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband.

The mobile and Arduino get paired with each other through Bluetooth module. During the time of pairing Bluetooth, the Bluetooth module ask for the password thus other user can't paired with the devices. After giving valid password the devices get paired with each other[7][8].

III. SOFTWARE IMPLEMENTATION

The PIR sensor placed in the robot helps to sense the human movement. As soon as the sensor sense the human movement, it sends signal to the mobile. The application installed in the mobile will give alert of presence of human.
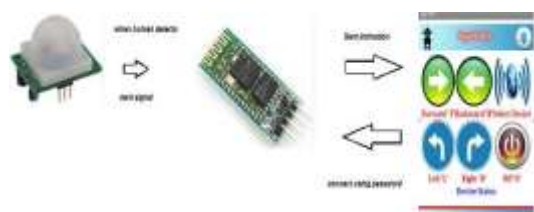

Fig 1: PIR sensor predict human motion

The obstacles can be overcome by placing ultrasonic sensor which helps to operate the robot turn.
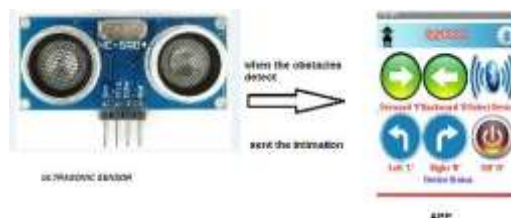

Fig 2:Ultrasonic sensor predict obstacles
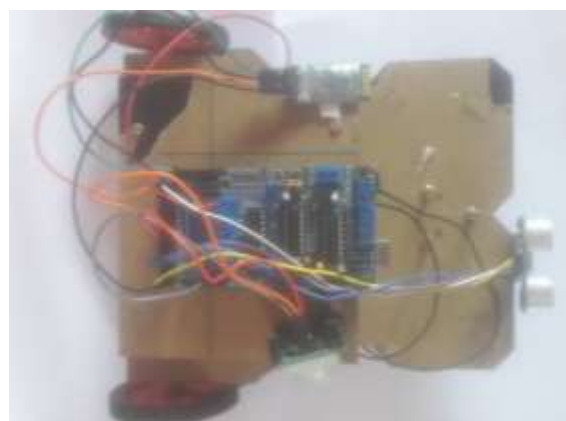
IV. RESULT AND DISCUSSION

Fig 3: Mobile Rescue Robot

V.CONCLUSION

The application helps the user to rescue people in a easy manner and therefore the people life can be saved in a quick manner. It will greatly improve the performance & efficiency of data transmission. The application of wireless sensor network can realize the real-time monitoring of affected area by the natural calamities.

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