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An Efficient Approach for Security Using Multipurpose Robot

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Abstract*: Our main aim is to design a remote controlled robot which detect live human body and transmit the location details through Zigbee module. it can be use in many application like disaster management during terrorist attack and in hazardous condition in boiler or reactors where only authorized person can enter . for detection of alive human body we have to use PIR sensor .for detection of alive human body we have to use PIR sensor principle to t detect the human body. The principle of human body when its temperature goes above absolute Temperature it emits radiation which is not visible to Normal eye. Then PIR sensor senses the passive infrared rays to detect live human body this activity is carried out by using human live detection sensor ,that detect motion and it will inform to the Microcontroller*

Keyword: -*PIC 16F877A Controller, Sensors, LCD Module, DC Motor,wireless camera, zig-bee.*

1. INTRODUCTION

The proposed embedded robotic system detects a live human body in the catastrophic environments which is very helpful for rescue operations. Disasters can be of two kinds- natural and human-induced. Natural disasters are not under the control of human beings. They include earthquakes, floods, storms, cyclone, fire etc. Besides natural disasters, an urban area is very susceptible human-induced disasters. They include industrial accidents, transportation accident, accidents during mining, warfare etc. Whatever may be the reason, during such calamities, various services are deployed for rescue operations. In order to increase the probability of saving lives of the victim, the rescue operation needs to be faster.

In such circumstances, mobile robots have been proposed to be deployed to help them and to perform tasks that can be performed neither by rescue team nor by existing tools and techniques since some years. In this project we are using ZigBee for the efficient wireless communication. The proposed system uses a sensitized circuitry in order to detect the motion of living.

2. LITERATURE SURVEY

Looking over the robotics literature for the past 30 years, USAR has always been talked about as a good application for robotics. Prof Shigeo Hirose in the Tokyo Technical Institute was probably the first person to build robots specifically for USAR. Robin Murphy in the University of South Florida appears to be the first to have a sustained focus on artificial intelligence for USAR robotics. (Mills, C, 1995) Fortunately, many researchers are getting involved these days, both because of the terrible earthquakes in Turkey and Taiwan and because of the challenge. Prof Satoshi Tadokoro in Kobe University became involved when one of his graduates was trapped for several days during the Kobe earthquake. (Mills, C, 1995) A competition called Robocop Rescue is dedicated to encouraging researchers to develop intelligent robots for USAR. In the US, as a new rising research field, USAR robot research is fined by some large research organizations, such as FEMA (the Federal Emergency Management Agency), NSF (National Science Foundation), DARPA (Defense Advanced Research Projects Agency), etc. Industry is another finding source because if a robot can be used for USAR, it also can be used to access a possible biological, chemical, or nuclear spill, or help gather data in a hostile situation. Following are the some design approaches these are Remote Operated and Controlled Hexapod (ROACH): ROACH is a design that provides significant advantages in mobility over wheeled and tracked designs. It is equipped with cameras which transmit live audio and videos of the disaster site, as well as information about locations of objects with respect to the robot's position to the interface on the laptop.

3. EXISTING SYSTEM

Given this review of the general state of human-robot collaboration, and the presentation and review of using AR to enhance this type of collaboration, the question is: what are promising future research directions? Two important concepts must be kept in mind when designing and effective human-robot collaboration system. One, the robotic system must be able to provide feedback as to its understanding of the situation and its actions (Scholtz2002). Two, an effective human-robot system must provide mechanisms to enable the human and the robotic system to communicate effectively (Fong, Kunz et al.2006). In this section, each of the three communication channels in the model presented is explored, and potential avenues to make the model of human-robot collaboration become a reality are discussed.

4. PROPOSED SYSTEM

The proposed embedded robotic system detects a live human body in the catastrophic environments which is very helpful for rescue operations. Disasters can be of two kinds- natural and human-induced. Natural disasters are not under the control of human beings. They include earthquakes, floods, storms, cyclone, fire etc. Besides natural disasters, an urban area is very susceptible human-induced disasters. They include industrial accidents, transportation accident, accidents during mining, warfare etc. Whatever may be the reason, during such calamities, various services are deployed for rescue operations. In order to increase the probability of saving lives of the victim, the rescue operation needs to be faster.

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5. SYSTEM ARCHITECTURE

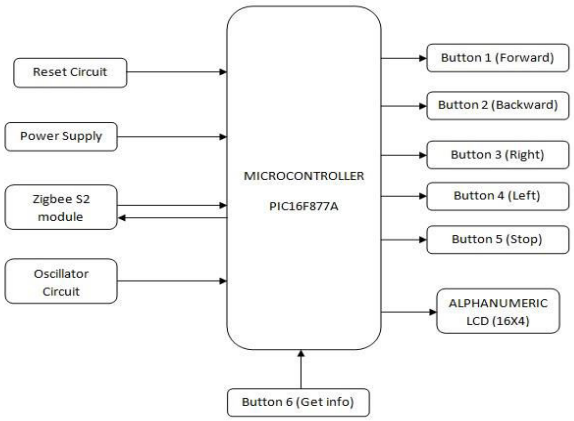
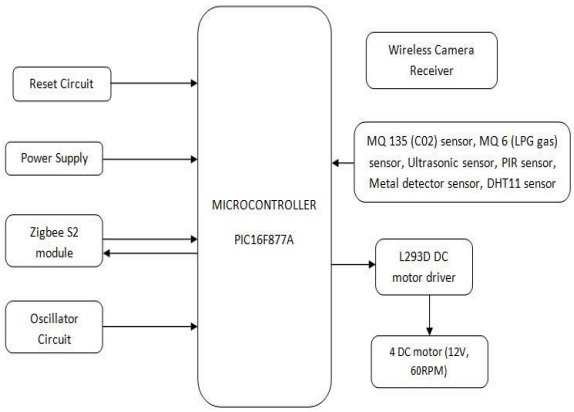


Fig -1: Block Diagram

Transmitter Block diagram Description:

Block diagram of Transmitter consist of microcontroller PIC 16F877A, Reset Circuit, Power Supply, Zigbee (S2) module, Oscillator Circuitry, Alphanumeric LCD (16*4), 6 Buttons. The power supply used here is a bridge rectifier with 5V and 3.3V regulators. All other ICs use 5V. Microcontroller used is PIC 16F877A.The brown out reset facility is available for brown out reset. An LCD display is connected to P1 port of the microcontroller to display the information. Zigbee module is use for wireless communication between Transmitter & Receiver .Button is use to operate Robot. 230V, 50 Hz power supply is use to converts mains AC to low-voltage regulated DC power.



Receiver Block Diagram Description:

Receiver block diagram consist of Reset circuit, Power supply, Zigbee(S2) Module, Wireless Camera Receiver,CO_2,Smoke,Ultrasonic,PIR,Metal Detector Sensor,L293D Motor Driver IC,4 DC Motors(12V,60 RPM).Sensors are used to detect alive human body. Wireless camera is use to

monitoring location of hazardous location where human operator cannot reach. L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. Power supply is used to provide power to the transmitter & receiver section of robotic system.230V, 50 Hz power supply is use to converts main AC to low-voltage regulated DC power .60RPM 12V DC geared motors for robotics applications. It gives a massive torque of 38Kgcm. The motor comes with metal gearbox and off-centered shaft.This powerful (200 nanosecond instruction execution) yet easy-to-program (only 35 single word instructions) CMOS FLASH-based 8-bit microcontroller. All of these features make the PIC16F877A ideal for more advanced level A/D applications in automotive, industrial, appliances and consumer applications.

6. SYSTEM REQUIREMENT SPECIFICATION

6.1SOFTWARE REQUIREMENTS

1. Proteus for simulation of circuit
2. Protel for artwork/layout of PCB
3. MPLAB compiler
4. Flash Magic for testing of serial communication

6.2HARDWARE REQUIREMENTS

1. Microcontroller PIC16F877A
2. Reset button and reset components (10k ohm and push button)
3. Crystal oscillator of 20MHz and capacitors of 22pf
4. Zigbee S2 pair
5. 16x4 Alphanumeric LCD
6. PIR sensor
7. DHT sensor
8. LPG sensor
9. CO2 sensor
10. Ultrasonic sensor
11. Metal detector sensor
12. 12V DC motor
13. L293D DC motor driver IC
14. 12V DC battery
15. Wireless camera.

7. TECHNICAL SPECIFICATIONS

7.1ADVANTAGES

1. It is safe method for operation to detect alive humans.
2. This robotic system is advantageous for saving human life from natural disaster & human disaster.
3. It is fast and accurate.
4. It reduces the work load.

7.2APPLICATIONS

- In military application to detect the presence of human being
- In rescue operation where human reach is impossible
- In disaster management

8. CONCLUSIONS

The purpose of the proposed system is to provide a cost effective robot for rescuing human beings in catastrophic conditions. The proposed system is superior to other existing robots due to the use of sensors that are cheaper and easily available. It is not feasible for rescue personnel to individually visit the site & check who is alive and who needs rescue. So, in such circumstances, the proposed system can be of great importance.

In this report, a new method for detecting surviving humans in destructed environments using simulated autonomous robot is proposed. The robot uses two levels of sensing in order to achieve higher cost-effectiveness in the detecting process in terms of the actual cost of equipment, the processing cost, the communication cost, the storage cost, and the power cost. The first level is an ultrasonic sensor that is used as the primary sensor in order to detect the existence of living humans in a scene. The second level is a human body shape sensor. The robot is assumed to be equipped with a simple Temperature and bomb sensor in order to detect fire in Rescue scenario and suspected metal respectively and a wireless communication link in order to communicate with the rescue team whenever a need arises.

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it has been our endeavor to throughout our work to cover the entire project work.

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