

ALIVE HUMAN DETECTOR ROBOT FOR RESCUE OPERATION

PROF.AMAR PAWDE,KHAN SHAHEEN,KHAN NAZREEN,KHAN JAMEER, PATEL
SALMAN

Electronics Engineering Department
M.H.Saboo Siddik College Of Engineering
University of Mumbai, India

Abstract—Disaster like earthquakes, bomb explosion, and floods often cause loss of precious human lives. During such emergency situations, and especially in urban disasters, in order to prevent loss of life and property, various essential services like policemen, fire fighters and medical assistance etc, are deployed. According to the field of urban search and rescue (USAR) the Probability of saving a victim is high within the first 48 hour of the rescue operation, after that the probability becomes nearly zero Generally rescue people(team) cannot enter into some part of the earth quake affected areas. All this task are performed mostly by human and trained dogs often in very dangerous and risky situation the rescuer may become a victim who need to be rescued. Hence to make a rescue operation more safe and effective robot has been proposed which detect alive human beings and wirelessly communicate with the rescue team. This work aims to developed and economical robot which works using P89V51RD2BN Microcontroller, PIR Sensor etc. It can be used in areas where rescue is needed. The robot senses the human body temperature using PIR sensor. Which gives the information about the presence of alive human body and message is sent through RF Transceiver(Head quarter 05) Using wireless mobile.

Keywords: PIR Sensor, P89V51RD2BN Microcontroller, wireless mobile camera, RF Transceiver(Head Quarter 05), wifi

I. INTRODUCTION

The advent of new high speed technology and the growing computer capacity provided realistic opportunity for new robot controls and realization of new methods of control theory. This technical improvement together with the need for high performance robots created faster, more accurate and more intelligent robots using new robots control devices, new drivers and advanced control algorithm.

This project deals with live person detection robot is based on P89V51RD2BN Microcontroller. This robot follows which is drawn over the surface. Here we are using PIR Sensor for detect the human. This project is mainly used in the earth quake rescue operation. Internally is consists of IR Sensors. The infrared sensors are used to sense the live person. Once the people are located it immediately gives audio alert visual alert to the authorities so that help can reach the live person faster. All the above systems are controlled by the microcontroller.

The Microcontroller is used to control the motors. It gets the signals from the PIR Sensor and it drives the motors according to the sensor inputs. Two DC Motors are used to drive the robot. The Microcontroller is programmed to send the live human information to remote control place through the RF Transceiver (Bluetooth module HC 05)

EASE OF USE

Looking at the destruction of lives caused in our country during EARTHQUAKE it grew in us the feeling to help the humanity in dedicated way. The rescue operation by the workers in inaccessible area during earthquake is very difficult and time consuming because it involves large area. This project proposes an autonomous robotic vehicle that move in the earthquake affected area and helps in identifying the live people and give them immediate medical treatment to carry out rescue operation.

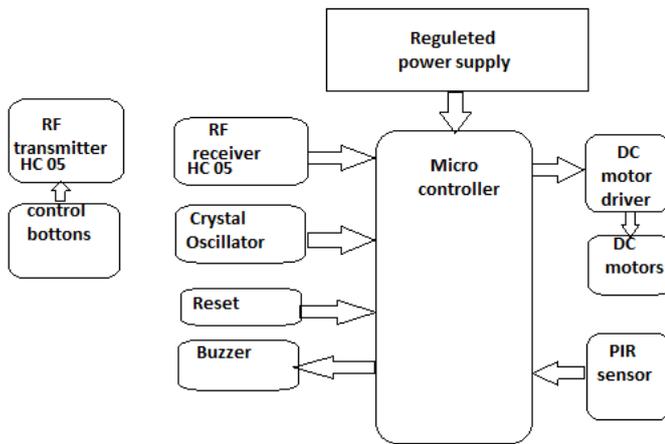
HARD WARE REQUIREMENT:

1. P89V51RD2BN Microcontroller
2. Bluetooth module HC 05 Transmitter and Receivers
3. PIR Sensor
4. Motor
5. Motor drive
6. Alarm
7. PC Interfacing

SOFT WARE REQUIREMENT:

1. MPLAB IDE – For controller programming
2. Or CAD – For circuit design
3. Eagle – For PCB design
4. Visual Studio for PC interface programming.

BLOCK DIAGRAM:



MICROCONTROLLER:

P89V51RD2BN is the microcontroller used in the project. Signals from PIR sensors are given to the microcontroller and this microcontroller will digitize the signal and send it to the RF Transceiver bluetooth module head quarter 05.. The controller has peripheral features like inbuilt ADC, required to get the signals from the various sensors. Beside this the microcontroller that is used in this project has some additional advantages. This microcontroller is a powerful microcontroller which provides a highly flexible and cost effective solution. It has features like 8K byte of In-system programmable flash memory, 4.0V to 5.5V operating range, 32 programmable I/O lines, fully static operation 0Hz to 33Hz.

PIR SENSOR:

PIR SENSOR As live human body emits thermal radiation it is received and manipulated by the PIR sensor to detect humans. PIR sensors are passive infrared sensors. They detect change in the heat and this can be used to detect movement of people. It has digital output and can be directly given to the digital pins and no ADC is needed. It operates at 5V DC The PIR (Passive Infra-Red) Sensor is a pyro electric device that detects motion by measuring changes in the infrared (heat) levels emitted by surrounding objects. This motion can be detected by checking for a sudden change in the surrounding IR patterns. When motion is detected the PIR sensor a high signal on its output pin. This logic signal can be read by a microcontroller or used to drive a transistor to switch a higher current load. Detection range up to 7 feet away. Some additional advantages of using PIR sensor are,

- Single bit output
- Jumper selects single or continuous trigger output
- Mode, 3-pin SIP header ready for breadboard or through whole Project,
- Small size makes it easy to conceal

-Compatible with BASIC Stamp, Propeller and many other microcontrollers.

RF TRANSCEIVER:

it is used to send and receive data between robot and the control unit. Here we are using class 2 bluetooth module with serial port profile, Which can configure as either master or slave a drop in replacement for wired serial connections, Transparent usage. HC 05 specification are:

1. Bluetooth protocol: Bluetooth specification v2.0 EDR
2. frequency:2.4GHZ ISM band
3. modulation: GFSK(Gaussian frequency shift keying)
4. speed: Asynchronous 2.1Mbps(Max)/160kbps, Synchronous 1Mbps
5. Power supply: 3.3VDC 50mA

MOTOR AND MOTOR DRIVE:

motor denotes the robot which can move over earthquake prone areas. Motor drive is the interfacing circuit between microcontroller and robot. The project uses DC motor. DC motors have polarity and direction of rotation depends on direction of current. But a DC motor cannot be interfaced to the microcontroller directly because it requires much higher voltage and current. Motor drive is used for this. It is built using an npn transistor –BC547. It acts as an interfacing device to supply required power to the motor

ADVANTAGES:

1. This System is an effective and a safe.
2. The System is safe even for the user because of the use of robotics and no manual work.
3. The system uses transceiver and this makes the system both accurate and reliable.

DISADVANTAGES:

1. Battery backup for camera is weak which can be overcome by using a solar panel.
2. The initial cost may be high if very high range sensors are being used in commercial usage.

APPLICATION:

for detecting alive humans in destructive environment.
War field or in the earth quake affective areas.
Military applications.

REFERENCES

1. “The 8051 Microcontroller Architecture, Programming & Applications” By kenneth J Ayala.
2. “The 8051 Microcontroller & Embedded System” By Mohammed Ali Mazidi & Janice Gillispie Mazidi

3. "Power Electronics" by M D Singh and K B Khanchandan
4. "Linear Integrated Circuits" By Roy Choudary & Sahil Jain
5. "Electrical Machines" By S K Bhattacharya