International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 05 Issue: 05 | May-2018 www.irjet.net p-ISSN: 2395-0072

7th SENSE: A MULTIPURPOSE ROBOT FOR MILITARY

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Abstract - *Main purpose of this work is to built a system that can be used for various military purposes. Our robot can be used for bomb detection, fire, smoke, temperature. The system has two modes in which the robot gets controlled. For controlling the robot two modes are used here. The first mode being automatic while the other mode being manual. In the automatic mode the robot will continously keep on detecting objects and if an intruder is found it will shoot them. Decisions are taken by the robot according to the sensor reading. While in manual mode the robot will be in work as per the user controls it. The robot continuously monitors and if it senses something, it will indicate it through buzzer. The manual mode is having full control over robot. Decisions are taken by the user controlling it.*

***Key Words*: Military, Purpose, Modes, Automatic, Manual, Intruder detection, Sensors**

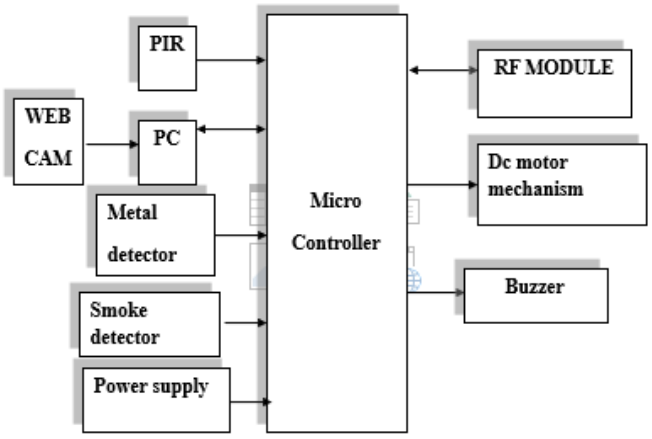
1. INTRODUCTION

One can create life no one has the rights to destroy it. The saying goes like this. Right from the early stage millions of humans have fought for their country and have lost life. In existing system there are only remote monitoring for robots are available. The vision system is used to carry out human detection and tracking of the objects. Here we control the robot with the help of humans only, so this is somewhat complex while implementing this system. To rectify it we go for a new system, which works in manual mode and automatic mode as well.

Communication is through RF Module. The microcontroller gets all the input and controls the robot according to it. The automatic mode has the robot is on its own. Decisions are taken by the robot on the basis of sensor reading. The robot continuously monitors and if it detects something, it will indicate it through buzzer. The manual mode is having full control over robot. Decisions are taken by the user controlling it.

In this way, it is a multipurpose robot. It communicates through RF Module. Robot has some sensors like Metal,smoke and fire, Temperature, and PIR. Smoke and fire sensor senses the smoke around the robot which is having a range from 65%±5%. Metal sensor used detects upto 7cm. PIR sensor senses the presence of human near the robot which has a range from 0-2m. The RF module detects upto 30m. Also,because of the camera used through matlab ,this robot can be provided as an application of spy robot.

2. DESIGN OF PROPOSED SYSTEM



2.1 MICROCONTROLLER:

ATmega16 microcontroller is used in the robot. It is 40 pin and 8 bit microcontroller.

2.2 SERIAL COMMUNICATION:

In this work, RS232 is used for communication between GUI made using MATLAB software and microcontroller. It is used to establish communication between microcontroller and the PC.

2.3 DESIGN OF GUI:

The RS232 standard is used to interface the computer with the microcontroller. Through the GUI, robot gets controlled. For eg, left direction, right direction, forward direction, backward direction, firing on ,camera on, automatic mode, manual mode are the options designed.

2.4 DC MOTOR:

To drive a dc motor, we need a dc motor driver called L293D. This dc motor driver is capable of driving two dc motors at a time.The dc motor driver used is L293D. Here, as the output current and voltage of the microcontroller is very less and that of DC motor is more,DC motor driver is used here for current boosting.

2.5 DISPLAY:

LCD is provided to display the different sensor readings the robot detects.

2.6 BOMB DETECTION:

Metal detector is provided for bomb detection in our work. Output is in digital form. Here we have connected the metal sensor to port A of microcontroller.

2.7 INTRUDER DETECTION:

PIR sensor is provided in the robot used. It has a range from 0-2m Output is in digital form.

2.8 SMOKE AND FIRE DETECTION:

Here we use MQ-6 smoke sensor. Output is in analog form. The sensor is connected to port A of microcontroller.

2.9 RF TRANSMISSION / RECEPTION:

Implementation of RF technology for transmission of information/data as well as reception is done here in our work. Output is in analog form RF module is connected to port D of microcontroller. RF transceiver used is shown in figure.

2.10 INDICATION:

In automatic mode, if anything is detected, buzzer is continuously in ON position which will grab the attention of control unit. In MANUAL mode, it indicates only once.

3. HARDWARE OF PROPOSED SYSTEM

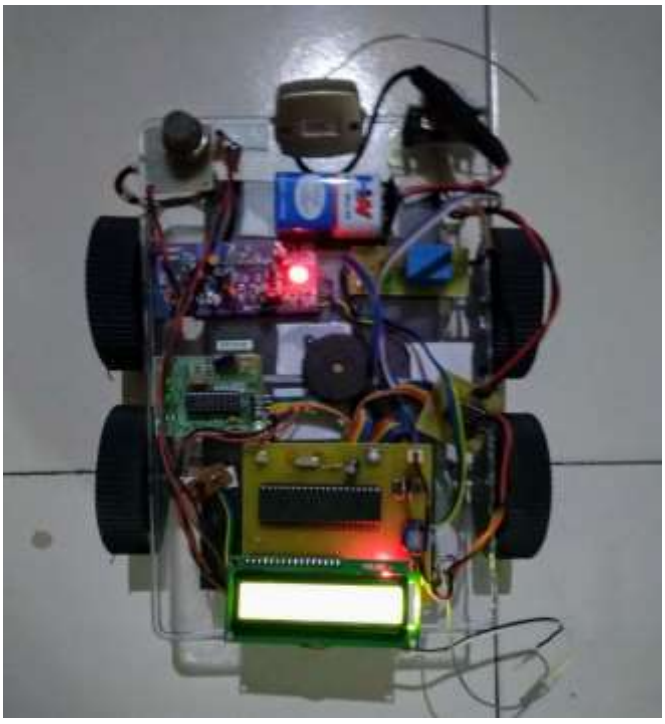


Figure 1. Robot

Figure 2. RF Transceiver

In this way,this work has been implemented.Here,figure 1 consists of full wireless robot whereas figure 2 is of RF transceiver used in RF module.

Following is the list of hardware used to implement the design.

- Atmega16 Microcontroller
- PIR sensor
- METAL Detection Sensor
- Keypad/GUI
- A/V Wireless Camera
- DC Motor Mechanism
- TV TUNER CARD
- SMOKE DETECTOR
- Temperature sensor
- Batteries
- LCD

SIMULATION AND EXPERIMENTAL RESULTS:

COMPONENTS	RANGE
Metal detector	7cm
Smoke and Fire detector	65%±5%
Temperature Detector	10° to 120°
PIR sensor	0-2m
RF Module	30m
Batteries	9V

Figure 3. Temperature, PIR, Gas, Metal detection display

Figure 4. Voltage, Gas, Metal detection display

Fig: RF Transceiver

Figure 5. GUI made to control robot with the help of MATLAB

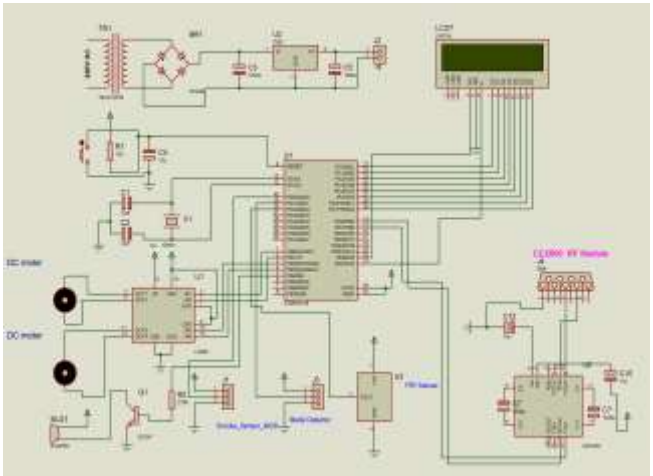


Figure 6. Expected Simulation

CONCLUSION:

Hence, the system that we have proposed is sure to successfully fulfill the various requirements of military system. The system is developed to work for various applications as a spy robot, for remote surveillances, bomb detection, fire detection.

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