

# WIRELESS CAMERA BASED HUMAN DETECTION ROBOT

<sup>1</sup>V Arun, <sup>2</sup>P Swapna, <sup>3</sup>S Sai sneha, <sup>4</sup>J Rahul, <sup>5</sup>B Raviteja

Dept. of Electronics and Communication Engineering,  
MLR Institute of Technology  
Hyderabad, India

**Abstract**— Robotics has been a staple of advanced manufacturing for over half a century. As robots and their peripheral equipment become more sophisticated, reliable and miniaturized, these systems are increasingly being utilized for military and law enforcement purposes. Mobile robotics play an increasingly important role in military matters, from patrol to dealing with potential explosives. “With suitable sensors and cameras to perform different missions, mobile robots are operated remotely for reconnaissance patrol and relay back video images to an operator. Now-a-days android smart phones are the most popular gadget. There are multiple applications on the internet that exploit inbuilt hardware in these mobile phones, such as Bluetooth, Wi-Fi and ZigBee technology to control other devices. With the development of modern technology and Android Smartphone, Bluetooth technology aims to exchange data wirelessly at a short distance using radio wave transmission comprising features to create ease, perception and controllability. In this paper we have designed a robot that can be controlled using an application running on an android phone. It sends control command via Bluetooth which is interfaced to the controller. The controller can be interfaced to the Bluetooth module through UART protocol. According to commands received from android the robot motion can be controlled.

The purpose of this project is to design a robot that can be operated using Android App that is AVR bootloader. The controlling of the Robot is done wirelessly through Android smart phone using the Bluetooth module feature present in it. Here in the project the Android smart phone is used for operating the Robot. Android provides access to a wide range of useful libraries and tools to build rich applications. Bluetooth is an open standard specification for a radio frequency (RF)-based, short-range connectivity technology that promises to change the face of computing and wireless communication. The controlling device of the whole system is a Microcontroller. Bluetooth module, DC motors are interfaced to the Microcontroller. The data received by the Bluetooth module from Android smart phone is fed as input to the controller. The controller acts accordingly on the DC motors of the Robot. The robot in the project can be made to move in all the four directions using the Android phone.

**Keywords**—Water sprinkler; Human rescue; Bluetooth module; Wireless Camera

## I. INTRODUCTION

Every year, many fire accidents occur and much loss occurs during these natural calamities. In such cases, humans are being trapped in the inner areas created by collapsed building either they may be in conscious or unconscious state. In the time of Rescue operation, several persons like fire fighters, police, and medical assistance are deployed. Our Project wireless human detection robot makes use of an Android mobile phone for robotic control with the help of Bluetooth technology. This is a simple robotics project using microcontroller. We have already seen Mobile Controlled Robot using DTMF technology. Also many wireless controlled robots use RF modules and PIR sensors. The control commands available are more than RF modules. Smartphone controlled robot is superior to all these robots. This project is a Bluetooth controlled robot. For this the android mobile user has to install an application on her/his mobile. Then user needs to turn on the Bluetooth in the mobile. The wireless communication techniques used to control the robot is Bluetooth technology. User can use various commands like move forward, reverse, stop, move left and move right. These commands are sent from the Android mobile to the Bluetooth receiver. Android based robot has a Bluetooth receiver unit which receives the commands and give it to the microcontroller circuit to control the motors. The microcontroller then transmits the signal to the motor driver IC's to operate the motors.

## II. RELATED LITERATURE

The existing robots are whole operated with the help of remote control. This operation is sometimes tedious, less efficient and has no guarantee for its security. The existing system consists of trade-off between processing speed, insecure communication and cost. With growing trends, controllers are developing tremendously. Hence we can make use of advanced controller in controlling the operation of robot. It can have many uses in practical fields. This project can be helpful in wars as a part of spying. It can be further improved to have more decision taking capabilities by employing varied types of sensors and thus could be used in big industries for different applications.

### A. Block Diagram

The hardware block diagram is as shown in figure 1

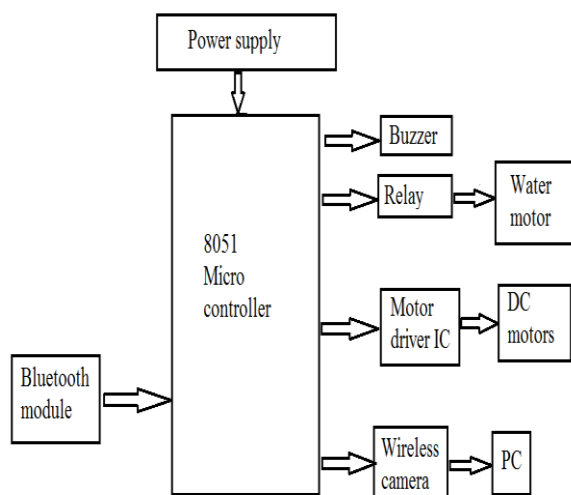


Figure 1

Whenever any accident occurs and if the victim is in risk where rescuers can not help him to get out there this robot can help out. First we need to connect the robot to our mobile so that it can be operated easily later the robot is directed towards the victim using the commands as we have written in our coding part. Here we can know the position and situation of the victim in our mobile as we are having a wireless camera attached to the robot. By doing this we can know the situation of victim and rescuers can make a way to help them. In this project we are also having a water sprinkler which can be useful in case of fire accidents.

### B. Working Principle of the proposed system

We proposed system consists of following components:

- Buzzer
- DC motor
- Microcontroller
- Relay
- Wireless camera
- Motor Driver IC
- Water sprinkler
- Bluetooth Module

#### a) Buzzer

A buzzer or beeper is an audio signaling device, which is to produce sound when an obstacle is detected. Here we are using buzzer to intimate us whether human is detected or not by which rescuers can know about the victim.

#### b) DC Motor

A dc motor uses electrical energy to produce mechanical energy by which the robot moves, very typically through the interaction of magnetic fields and current-carrying conductors. The input of a DC motor is current/voltage and its output is torque (speed) that results in movement. The DC motor has two basic parts: the rotating part that is called the armature and the stationary part that includes some coils of wire which are called as field coils. The stationary part is called as stator. Four DC motors are used in this project, which are used for rotating the wheels in the required direction.

#### c) Microcontroller

The microcontroller used here is a 40 pin microcontroller. The features of this controller are very accurate and also advantageous. Software entire coding part is dumped in this microcontroller with the help of which robot moves.

#### d) Relay

Relay is an electronic switch which is used to produce delays at regular intervals by which water can be sprinkled whenever we want.

#### e) Wireless Camera:

Here in this project camera is controlled by a mobile and we can see the directions and the position of the robot by which we can guess the situation of the victim and his surroundings which helps a fire fighter to rescue the victim.

#### f) Motor Driver IC:

It is a 16pin IC which makes to run DC motors in which direction we want to move the robot. It controls the set of 2 DC motors which means two DC motors can be controlled by using a single motor driver IC.

#### g) Water Sprinkler

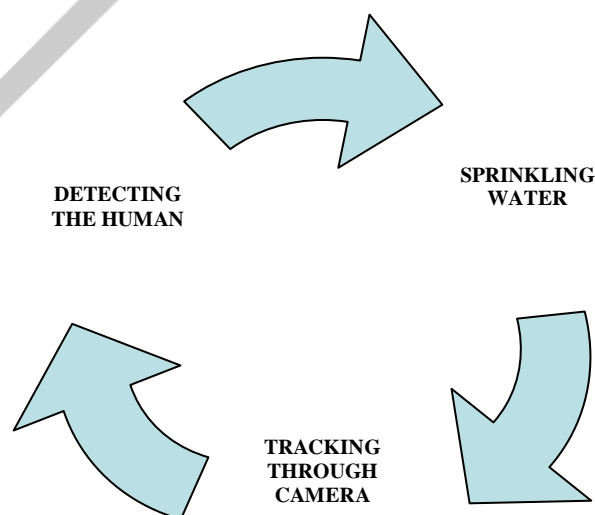
It is used to sprinkle the water in case of fire accidents by which we can the victim or make any way to move out of that fire.

#### h) Bluetooth Module :

Bluetooth module is used to connect the wireless camera to the mobile using an app called AVR bootloader by which a person can easily operate the robot and can watch the situation of the victim. This app helps in driving the motor in the direction we want.

### C. Sequence Of Coding Process:

By using this robot we can first detect the position and situation of the victim using a wireless camera if there is a major impact of fire then water sprinkler can help the victim to some extent by which he can be rescued.

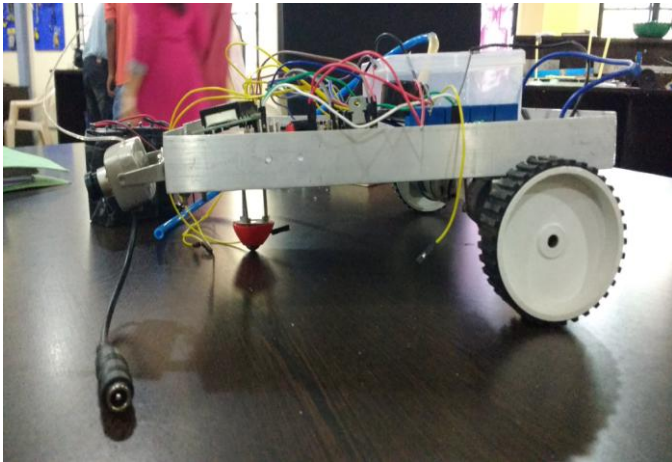


#### D .Software

Two softwares were used for coding and designing the circuit to check its performance. AVR Bootloader and a Proteus software are used.

Proteus : this software is used for designing the circuit by selecting and connecting the respective components. The code from compiler is saved and then dumped in the circuit in proteus software and then it is made to run. Here the clock frequency of controller can be set by double clicking on it. It can be checked after running the circuit whether there is a desired output what we want.

#### E.Prototype Of Human Detection Robot



#### F .APPLICATIONS :

1. This robot helps to save the victims in fire accidents or any other natural disasters.
2. The robot is small in size so can be used for spying.
3. The robot can be used for surveillance<sup>[1]</sup> or reconnaissance

#### III. CONCLUSION

Hence my prominent aim of this project is to fulfill the tasks like detecting and saving a human by using less energy sources and by less human risk .At the same time by using this human work can also be reduced. Thus aiming to save the human life.

#### ACKNOWLEDGMENT

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