MULTI-FUNCTIONALSERVICE ROBOT USING BLUETOOTH MODULE

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Abstract: Intelligent service robots are currently being developed to fulfill the demands in emerging areas and robotic applications ranging from entertainment to health care. Service robots are intended to be operate by non-expert users, and to perform their service tasks which involves direct interaction between the human and robot. Its function is to support people in their daily activities and make their lives easier. This project develops a mobile operated service robot capable for servicing indoor among work offices, colleges and other remote areas.

Keywords: RF Module, Arduino, Task Planning, Service Robot.

1.Introduction

You will find here Springer's guidelines for the preparation of proceedings papers Home automation and robotics make tele-care possible and will radically change health care practice over the coming years. Finally, we point to the fact that over the past years, 'simple' robotics technologies have given the entertainment industry a new face: think of Wii or Kinect. We will continue to be presented with such technological gadgets in the coming period.

New robotics offers numerous possibilities for making human life more pleasant, but it also raises countless difficult societal and ethical issues. The debate on the application of robotics to distant battlegrounds is very current, while the application of care robots is just appearing on the horizon. Prompted

by the arrival of new robotics, the Rathenau institute in 2011 and 2012 investigated the social meaning of robotics for the years to come in Europe and the US by studying robotics developments in five application domains: the home, health care, traffic, the police, and the army. For this study, a comprehensive literature review was carried out with the goal of selecting the most relevant articles on the robots of the five application domains and the related ethics.

We present a review of robots controlled by mobile phone via moving the robot upward, backward, left and right side by the android application such as Arduino, RF module. According to commands received from android the robot motion can be controlled. We derived simple solutions to provide a framework for building robots with very low cost but with high computation and sensing capabilities provided by the smart phone that is used as a control device. Our motive is to implement the fundamental concept of wireless communication on a small scale. The remotecontrol application of RF has been extended to operate a bot.

The main aim of the project is to implement a wireless robot which can be controlled through remote control using Bluetooth module and navigates around the areas and tries to detect obstacles, flames of fire and chemicals. In this project we will use a 433 MHz Transmitter and Receiver pair to allow the Arduinos on both the ends to communicate wirelessly with each other. Here the Robot can detect the obstacles through the use of ultrasonic sensors. Apart from this the Robot can detect flames of fire through the use of flame sensor. The robot will be able to implement one of these three functions at a time

2 .OVERVIEW OF PROJECT

This project represents bluetooth module application based remote controlled robotic car. Here main motto of our project is to control the car with remote application. Here we use mainly Arduino UNO (ATMEGA 328P), RF module. We interface the RF module with the system so that we can easily control the

system by remote application. This project is more necessary to the modern society in context of spying and surveillance. The project aims in designing a Robot that can be operated using remote. The controlling of the Robot is done wirelessly through remote. Here in the project the remote is used as a controller for operating the Robot. The controlling device of the whole system is a Microcontroller. RF module, DC motors are interfaced to the Microcontroller. The data received by the RF module from transmitter is fed as input to the controller. The controller acts accordingly on the DC motors of the Robot. In achieving the task the controller is loaded with a program written using Embedded 'Arduino' language. Still there exists a requirement of a cost-effective automation system, which will be easy to implement. An example of such a cost-effective project has been proposed here.

3.WORKING OF THE PROJECT USING REMOTE CONTROLLED

The working mechanism of the robot is based on the information passed from the android mobile phone via Bluetooth connection to the robot using Bluetooth modem and vice versa. When user will give a commands by android phone that will transmit and receive the information signals by giving a commands it will move in the given command direction. Here is the power supply is given to robot by eco-friendly solar panel and storage batteries by using both solar panel and batteries we are capable to run the robo. If there is no power or no light energy then power supply is used as vice versa

Fig. 1.Block diagram of the project

4. CONTROLLING OF ROBOT

Here are the steps for how to use android application to control the robotic vehicle.

1) Download the application "BT VOICE CONTROL FOR ARDUINO" from Google play store and install it.

2) First make sure your HC-05 Bluetooth module is paired with your mobile. The default password for pairing is "1234" or "0000".

3) Check once you get started with the application, the Bluetooth of the mobile is automatically enabled.

4) Click on "connect robot" option present in options menu.

5) Now select HC-05 to get paired with the module. After pairing it is ready to use.

6) Now click on the "MIC" icon and speak or instruct the robot verbal.

7) When you speak "left" your speech gets recognized and converted into text. That text is transferred to robot through Bluetooth.

8) The robot receives the string, decodes it and compares it with the Instructions that are described in the program and moves the robot in forward direction.

9) The same in the case of Up, Left, Right, down Stop.

10) As per command given from android app, motor is drive in up, down, left, right and stop in this way.
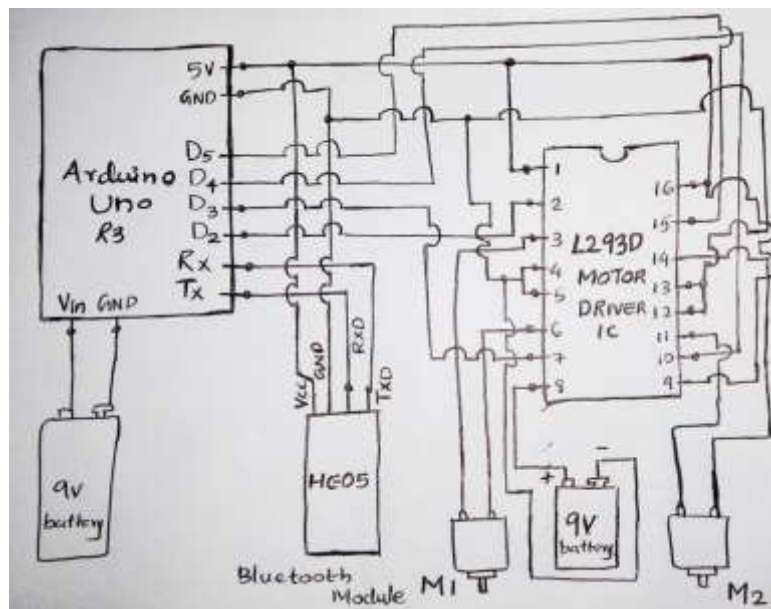
5. CIRCUIUT DIAGRAM

Fig. 2.Circuit diagram of the project

When a key is pressed, the corresponding data is transmitted to the Bluetooth Module from the Phone.

In the Arduino code, the Arduino UNO receives any of this data from the Bluetooth Module (as per the key pressed) and performs a simple switch case operation, where each case associated with appropriate instructions to the Motor Driver Input Pins.

For example, if 'Forward' key is pressed in the Android Phone, then '1' is transmitted. Arduino will then make IN1 and IN3 as HIGH and IN2 and IN4 as LOW to achieve a forward motion. The corresponding data associated with each key is as follows:

Forward – 1 Reverse – 2 Left – 3 right– 4 Stop – 5
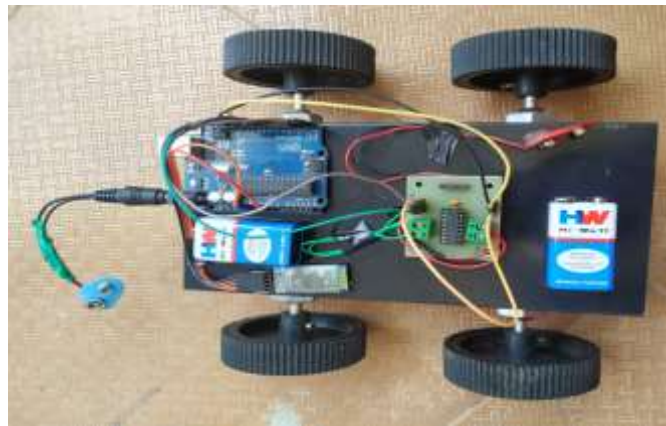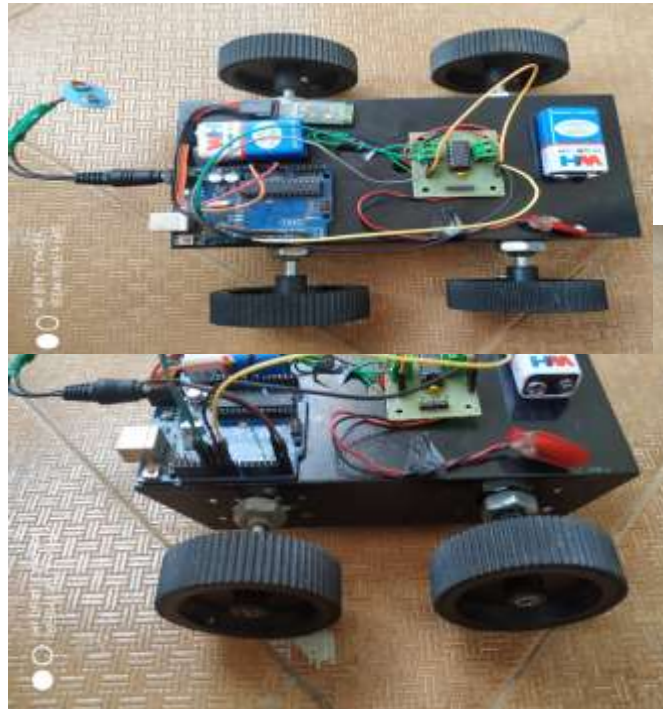
6. ADVANTAGES

- ❖ Robots can go far down into the unknown places where the humans would be crushed, they can give us the information that humans can't get.

- ❖ They can work at places 24/7 without any salary and food and they don't get bored.

- ❖ Robots can perform the tasks faster than the humans and much more consistently and accurately.
  Robots do not require to sleep or take breaks, they are able to function without stopping. They can work a long time without service and maintenance.

- ❖ Robots can spy on the people in ways the people can't move and from views the humans can't reach.

7. DISADVANTAGES

- ❖ As the range of the Bluetooth Communication is limited (a maximum of 10 meters for class 2 devices for example) the control range of Bluetooth Controlled Robot is also limited.

- ❖ If the power is not sufficient, even though the Bluetooth Module powers on, it cannot transmit data or cannot be paired with other Bluetooth devices.

8. APPLICATIONS

- ❖ Low range Mobile Surveillance Devices.

- ❖ Military Applications (no human intervention).

- ❖ Assistive devices (like wheelchairs).

9. CONCLUSION

Now a days usage of robots increasing day by day in every industry. In our project service robot is designed to fulfill daily needs of human beings in which the android sends the radio signals to the Bluetooth module used to catch the signals which are transmitted through the android. After receiving the signal Arduino reads and transmitted to the motor driver IC with the help of logic signal motors gets operated in required direction

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