Android Based C19 Warrior Robot

Hiral Parmar
Electronics And Telecommunication
Genba Sopanrao Moze College of Engineering
Pune, India

Vidyavati Metry
Electronics And Telecommunication
Genba Sopanrao Moze College of Engineering
Pune, India

Prachita Hasebe
Electronics And Telecommunication
Genba Sopanrao Moze College of Engineering
Pune, India

Prof.Sushma Patwardhan
Electronics And Telecommunication
Genba Sopanrao Moze College of Engineering
Pune, India

***Abstract*—Nowadays smartphone has become the most essential thing in our daily life. And most of the things are based on android application only. Our project describe that without coming in contact with human how to provide service to them. This project is based on android application . The user can install application in their phone and can operate by turning on Bluetooth. Various command can be sent like forward ,backward, left ,right using android phone. Robot has a receiver which can accept those command and move accordingly**

Keywords—Bluetooth, Motor, Motor Driver, Arduino, Android, Wireless

I. INTRODUCTION

After developing few popular robotics project like line follower robot, edge avoiding robot, DTMF robot, gesture controlled robot, etc. in this project we are doing to develop a Bluetooth control robot. Here we used a Bluetooth module to control the robot , and it is also an android based application.

The project aim is designing a Robot that can be operated using Android mobile phone. The controlling of robot is done wirelessly through android smart phone using Bluetooth feature present in it. Here in the project the android smart phone is used as a remote control for operating the robot. Android is software stack for mobile device that include an operating system . Android boasts a healthy array of connectivity option, including Wi-Fi, Bluetooth, and wireless data over a cellular connection. Android provide access to a wide range of useful libraries and tools that have been built from the ground up alongside the platform providing developer with high productivity and deep insight into their application. Bluetooth is a open standard specification for radio frequency based short face of computing and wireless connectivity technology that promise to change the face of computing and wireless communication. It is design to be inexpensive , wireless networking system for all classes of portable such as laptop, PDA , mobile phone. It also enable wireless connection for desktop computer, making connection between monitor printer, keyboard and CPU cable free. The controlling device of whole system is a microcontroller , Bluetooth module , DC motor are interfaced to the controller . The controller acts accordingly on DC motor of the robot.

II. LITERATURE REVIEW

The main aim is to design the cost -efficient Bluetooth controlled robot car for material handling which is eco friendly. Many researchers had developed robotics system so reduce human efforts and described their technologies . These robotics design were controlled by software programs. This system was used for transferring the information wirelessly.

[1] Kazacos Winter , J : Android controlled mobile robot(2013) On the other hand , the robotics system was developed using 8051 microcontroller, Bluetooth module which has attached a camera for surveliance.

[2] Selvam ,M : Smart phone based robotics control for surveillance application Int .J. Res. Eng Technol.3(3),299-232 (2014) Guardi et al. invented a communication-based robotic platform using Android and Bluetooth.

[3] Birk ,A. Schwertfeger, S. , Pathak , K : A networking framework for teleoperation in safety ,security and rescue robotics. IEEE Wirel. Commun. 16(1),6-13 (2009) Braun et al. described navigation system for autonomous off-round robots which depend on navigation to avoid obstacles in the map.

[4] Braun, T. ,Schaefar , H, Berns, K, Topological large scale off road navigation and exploration RAVON at the European Land Robot Trial 2008. Tezel and Hangun designed and implemented a Bluetooth controlled robot using Arduino. In this collision free design ,sensor data was got by linear interpolation.

[5] Goud, R.K. , Kumar,B.S. : Android based robot implementation for pick and retain of objects. Int .J.Eng. Trend Technol(IJEET) 16(3) (2014). The Android based robotics car via Bluetooth module was also invented .

[6] Pahuja ,R. ,Kumar , N. : Android mobile phone controlled Bluetooth robot using 8051 microcontrollwe .Int. J. Electron. Electr. Eng ISSN,pp.(2014) Ritika Pahuja and Narendra kumar designed an Android based robot car. When the Android app is turned on, the system is connected via Bluetooth. The Android provides a user friendly experience.

A. Bluetooth Module (HC-05) :

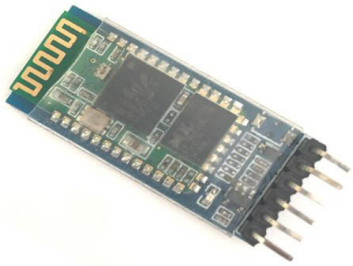

Fig.a

Serial Bluetooth module product consist of Bluetooth serial interface module. Bluetooth serial module is used for converting serial port to Bluetooth. This Bluetooth connection is equivalently liked to serial port line connection including RXD ,TXD signals And they can communicate to each other .

The Bluetooth device in the market mostly are slave device , such as Bluetooth printer , Bluetooth GPS.

- Operating Voltage : 4V to 6V (Typically +5V)
- Operating Current : 30mA
- Range: <100m
- It Can be easily interfaced with Laptop or Mobile phone with Bluetooth

B. DC Motor :

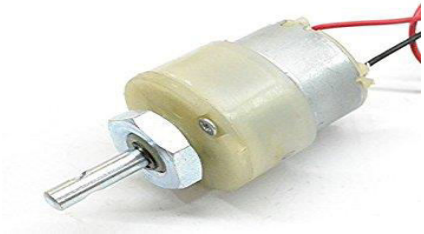

Fig.b

Almost every mechanical movement that we see around us is accomplished by an electric motor . Electric machines are means of converting energy. Electric motor is used to power hundreds of devices we use in everyday life.

- High efficiency Design.
- Able to operate at high speeds.
- 200RPM, 12V DC Motors with Gearbox
- 6mm shaft diameter with internal hole
- Motor weight :290gms
- Load Current=300mA(max)

C. Motor Driver :

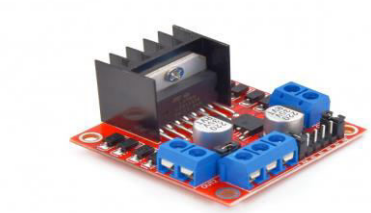

Fig.c

The pin 8 of IC should be connected to the 9v battery or 12v. This pin is internally connected to the driver circuit inside the IC which helps the motor to get the good supply which also helps the smooth functioning of motors.

- Dual H Bridge Motor Driver
- L298N motor driver IC
- Drives up to 2 bidirectional DC motors
- Integrated 5V power regulator
- 5V – 35V drive voltage,2A max current

D. Arduino UNO :

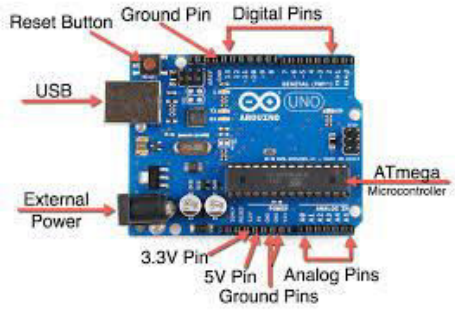

Fig.d

The **Arduino Uno** is an open-source Microcontroller board based on Microchip ATmega328P microcontroller and developed by Arduino.cc

- Microcontroller board based on the ATmega328P.
- 14 digital input/output pins (of which 6 can be used as PWM outputs)
- 6 analog inputs.
- 16 MHz quartz crystal
- A power jack
- Operating voltage : 5V
- Operating current : 1A
- Connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

III. BLOCK DIAGRAM

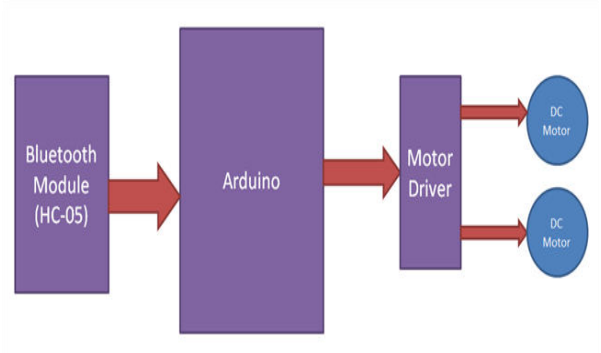

Fig.e

IV. CIRCUIT DIAGRAM

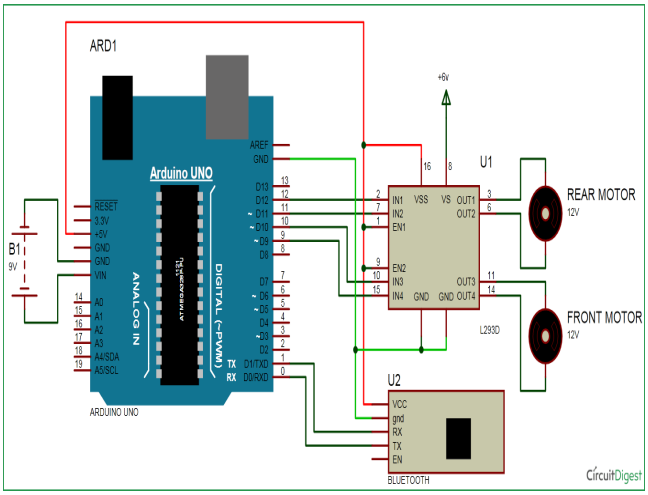

Fig.f

V. WORKING

A smart phone Android operated robot. Now here is a simple to control your robot car using Bluetooth module HC-05 and 8051 microcontroller with your android Smartphone device. The controlling device of the whole system are a microcontroller .Bluetooth module ,DC motors are interfaced to the microcontroller. The data receive by the Bluetooth module from android smart phone is fed as input to the controller .The controller acts accordingly on the DC motor of the robot. The robot in the project can be made to move in all the four directions using the android phone. The direction of the robot is indicators using LED indicators of the Robot system .In achieving the task the controller is loaded with program written using Embedded 'C' Languages. Android smart phone controller Bluetooth robot using microcontroller . Block diagram of android smart phone controller Bluetooth robot using 8051 microcontroller . First make sure that that your HC -05 Bluetooth module is paired with your phone. The Bluetooth module: The Bluetooth module used is a HC-05 based on SPP support Features:

- Wireless serial Bluetooth port.
- With free power adapter bottom board come with well power regulatsor . User can connect 3.3 to 5V DC and connect TX and RX to your control IO.
- Easy to connect this module with PC , just search.
- Step to connect :
- 1. Connect the wiring properly , while the device is not connected , the Bluetooth module is paired with your phone. Check the manual of Bluetooth module . Click o 'SELECT DEVICE' icon to select paired Bluetooth module . When press up arrow it send to data "A" the robot car moves FORWARD . When press DOWN arrow it send the data "B" to Bluetooth module connected with the circuit .
- When microcontroller detects "B" the robot car moves REVERSE . When press LEFT arrow it send the data "C " the robot car turn left . When press "RIGHT " arrow it send the data "D" to Bluetooth module connected with the circuit . When microcontroller defects "E" the robot car gets stop . Click on Disconnect icon paired Bluetooth module.

VI. ANDROID APP

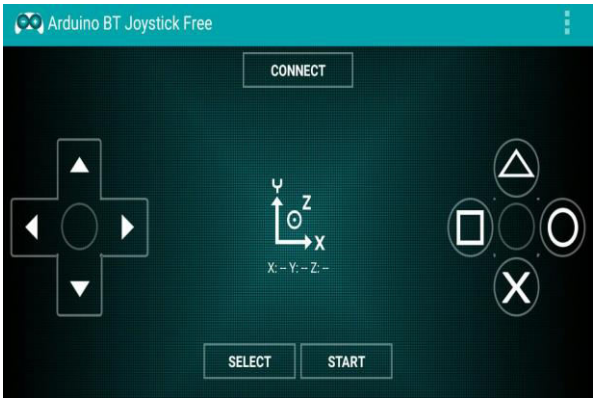

Fig.g

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