

Voice Recognition System Using Internet of Things

¹Shailesh Kumar Vyas, ²Gunjan Gadre, ³Nikhil Kawdeti, ⁴Surekha Ghugal,
⁵Vibhuti Jain

1. *Asst.Prof. CSE Department, G.H. Rasoni University, Saikheda, Madhya Pradesh
Email- Shailesh.vyas@ghru.edu.in*
2. *Student CSE Department, G.H. Rasoni University, Saikheda, Madhya Pradesh
Email-gadre_gunjan.ghru@ghru.edu.in*
3. *Student CSE Department G.H. Rasoni University, Saikheda, Madhya Pradesh
Email-kavdeti_nikhil.ghru@ghru.edu.in*
4. *Student CSE Department, G.H. Rasoni University, Saikheda, Madhya Pradesh
Email-ghugal_surekha.ghru@ghru.edu.in*
5. *Student CSE Department, G.H. Rasoni University, Saikheda, Madhya Pradesh
Email-jain_vibhuti.ghru@ghru.edu.in*

Abstract: A robot is an electro-mechanical machine that is usually guided by computer and electronic programming. Many robots are built for manufacturing purposes and can be found in factories around the world. The latest inverted ROBOT design can be controlled using the APP for Android mobile. And in this, we use Bluetooth communication to interface with Arduino UNO and Android. The robot can control the speed according to the commands from Android. The project was developed to be controlled by robotic voice commands. An Android application with a micro-controller can be used for essential tasks. The connection between the Android app and the vehicle is facilitated by Bluetooth technology. The robot is controlled by a user-spoken command in the application. The movement of the robot is facilitated by two DC servo motors connected to a microcontroller on the receiver side. The Bluetooth RF transmitter converts the commands coming from the app into the appropriate range (approximately 100 meters) as a digital signal. The purpose of a voice-controlled robotic vehicle is to perform the required tasks by listening to user commands. Work depends on the Arduino microcontroller, motor driver, and Bluetooth module. Arduino is open-source hardware (single-board microcontroller and kit) used to make digital devices. The idea is to first design the system's hardware and then code the entire function using our previous knowledge of programming. The code is then simulated in software (IDE) and then interfaced with the hardware. The integration of the control unit with the Bluetooth device can be achieved by capturing and reading voice commands using the Bluetooth module. Controlling Remote is a smart Android device with a Bluetooth application.

Keywords— Arduino, Bluetooth Module (HC-05)

I. INTRODUCTION

These days smartphones are evolving more powerful with reinforced processors, larger storage capability, tremendous leisure functions and additional communication methods. Bluetooth is used entirely for data interchange; Add current features to smartphones. It altered how people use digital appliances in office and changed traditional wired digital equipment wireless devices. The host Bluetooth device can communicate with up to seven traditional modules simultaneously. Considering its typical work area within eight meters, it is especially useful in a home environment. In recent years, the open-source platform or [5]. Android is widely used in smartphones. Android has a complete software package that includes OS, middleware layer and core applications. When we control the voice, the first word to consider in speech recognition is a technique where the system describes the given words through speech. The main goal of this project is to control the Smart Vehicle by the human voice. In this system, we use the voice recognition module to identify the user's voice to control the direction of the Vehicle. Internet of Things (IoT) is an advanced automated and mathematical system that specializes in artificial intelligence, sensors, communications, electronics, cloud messaging, and more to provide complete systems for products or services. The system created by IoT has more transparency, control

and performance. In recent years, the voice recognition system has been growing day by day. Examples of voice recognition these days are all the applications we use in our daily lives.

This technique requires reliability and precision. The concept that a person can speak is attached to a specific device and those words are fed into the system. Converting voice recognition into data is a feature behind these. This project is related to the voice recognition system, which is an important part of identifying voice commands and transmitting them to the system via a wireless module. The framework includes a controlled Bluetooth communication module. It is connected to another option of motor and system. When the Bluetooth application is turned on and connected to the system via the Bluetooth module, it works by giving commands from the application using the function already fed. The system works on a function installed in Arduino. The system stops backwards, forwards, left, right and in the four directions in which it is installed.

II. PROPOSED METHODOLOGY

Arduino: Arduino is a simple integrated development environment (IDE) that runs on PC and allows users to write programs for Arduino in C or C++ language. The entire program is installed on an Arduino controller. Arduino is an open source electronics platform based on simple hardware and software. The project used the Arduino board as a voice recognition module. It detects and processes voice commands and saves all voice commands to the Arduino controller.

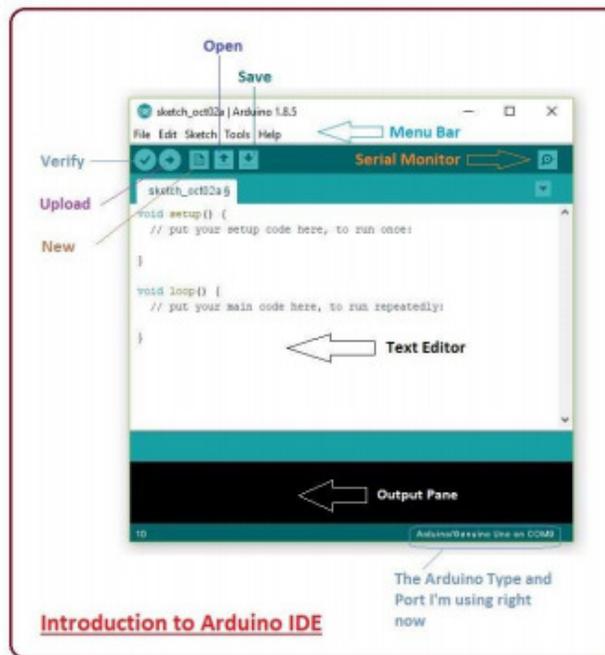


Fig1. Arduino IDE

Arduino UNO: The Arduino Uno is a 8 bit microcontroller board based on the ATmega328P. It has 14 digital pins and 6 analog pins and other power pins such as GND, VCC, which includes 14 digital input / output pins (6 used as PWM output), 6 analog inputs, a 16 MHz ceramic resonator, a power jack, ICSP header and reset button. It has SRAM 2kb and flash memory 32kb. EEPROM with 1KB. Arduino is an open source hardware board that has many open source libraries that want to interface with LEDs, motors, IR sensors and many other external components of the board's microcontroller, interfacing with the Arduino board. The Arduino full board, which has everything to connect to external peripherals and programmed by computer. It has everything you need to support a microcontroller. We need to connect it to a computer using a USB cable or power it with an AC-to-DC (7-12v) adapter. The Arduino circuit acts as an interface between the software component and the hardware component of the project [10]. The Arduino Atmel used Atmega AVR series chips, especially the ATmega8, ATmega168, ATmega328, ATmega1280 and ATmega2560.

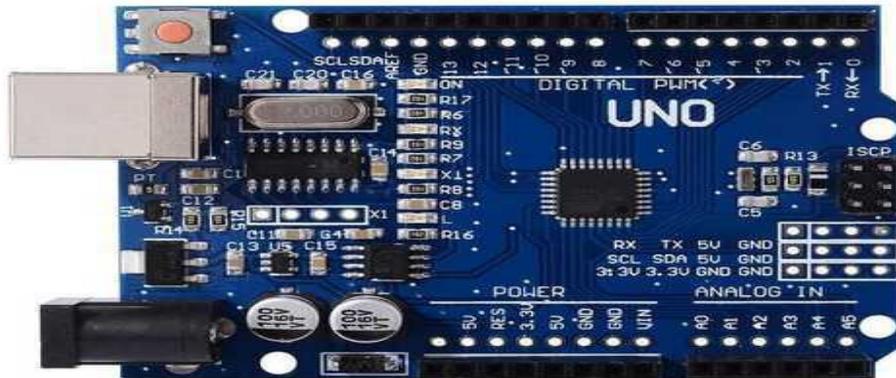


Fig2. Arduino UNO

Bluetooth module: User communication media is provided via the Bluetooth module on the Android phone and the system, i.e. by giving voice commands to the Android phone. Users send commands to BT Voice Control for Arduino Voice for software applications installed on Android phones. Connected via BT module. The HC-05 module is a Bluetooth SPP (Serial Port Protocol) module designed for transparent wireless serial connection setup. Serial port Bluetooth module Fully qualified Bluetooth V2.0 + EDR (enhanced data rate) Fully 2.4GHz radio transceiver and baseband with 3Mbps modulation It uses CMR Blu Core 04-external single Chip Bluetooth system with CMOS technology and AFH (Adaptive Frequency Hopping Feature).

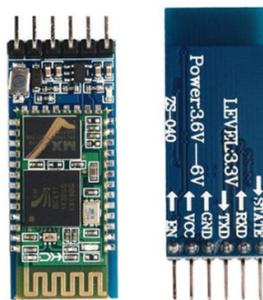


Fig3. Bluetooth Module HC-05

DC Motor driver Unit L298 : The input signal is given to the motor driver from the Arduino to generate the corresponding output for the motor this motor driver IC simultaneously drives two motors. DC motors are interfaces to the microcontroller. The data is received by the BT module from an android smartphone which is given as an input to the controller. Every mechanical movement we see around us is accomplished by an electric motor. Electric machines are a tool to convert energy. Motors take electrical energy and produce mechanical power. The L298 is an integrated monolithic circuit in a 15lead Multiwatt and PowerSO20 packages. It is a high voltage, high current dual full-bridge driver designed to accept standard TTL logic levels and drive inductive loads such as relays, solenoids, DC and stepping motors. Two enable inputs are provided to enable or disable the device independently of the input signals. The emitters of the lower transistors of each bridge are connected together and the corresponding external terminal can be used for the connection of an external sensing resistor. An additional supply input is provided so that the logic works at a lower voltage.

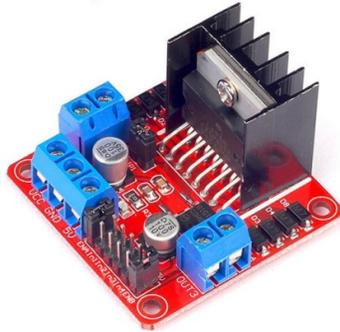


Fig4.DC Motor driver Unit L298

BO Motor with Tires - DC engine (BO) changes over electrical vitality into mechanical vitality. DC MOTOR idea is the place gears decrease the speed of the vehicle yet increment its torque is known as gear.



Fig5.BO Motor with Tires

Android Phone: In this project we will control the robot using Android Phone by using an application which we will get from Android Play store. By installing the application we can move the robot in four direction i.e., is front, reverse, left and right directions.

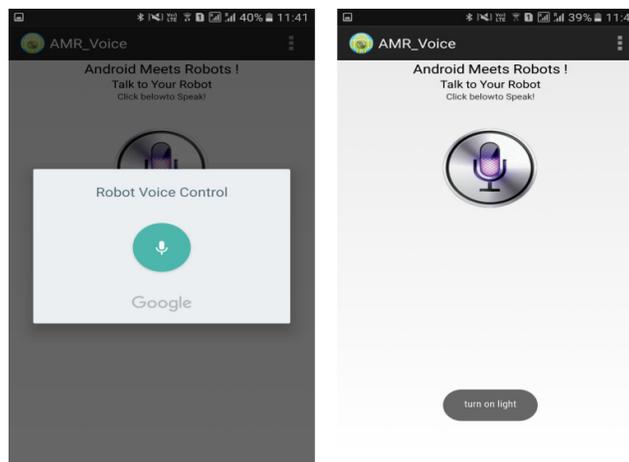


Fig6 .AMR Voice App On Android Phon

III.LITERATURE REVIEW

[1]. This paper depicts how to control a system utilizing portable through Bluetooth communication, a few highlights about Bluetooth innovation, segments of the versatile and system. It present an audit of system constrained by smart phone by means of moving the robot upward, reverse, left and right side by the android application.

[2]. In this paper have structured a system that can be controlled using an application running on an android smartphone. It sends control order by means of Bluetooth which has certain highlights like controlling the speed of the engine, detecting and sharing the data with android Application.

[3]. This paper, deliberate how to control voices system controlled vehicle utilizing Wi-Fi module through android application of an android Smart Phone. It is additionally show that the apparatuses can be controlled even without an android application by sending an ordinary SMS.

[4]. This paper depicts how to control a robot utilizing portable through Bluetooth communication, a few highlights about Bluetooth innovation, segments of the versatile and robot. It present an audit of this system constrained by smart phone by means of moving the robot upward, reverse, left and right side by the android application, for example, Arduino, Bluetooth.

[5]. This system is normally an electro-mechanical machine that is guided by PC and electronic programming. Numerous systems have been worked for producing reason. This paper build up the remote in the android application which control the robot movement with them. What's more, in which Bluetooth communication is used to interface controller and android.

[6]. from this notebook we can fully utilize our arduino Uno board. It has all the methods and beginner Levels thing about arduino. This notebook serves as a convenient, easy to use programming reference for the command structure and basic syntax of the Arduino microcontroller.

[7]. this paper explores the working principle and applications of an Arduino board. This also explores how it can be used as a tool for study and research works. Arduino boards can provide a quick tool in development of VLSI test bench especially for sensors. This paper provides a glimpse of the type of Arduino boards, working principles, software implementation and their applications.

[8].- This paper utilizes LPC2148 of ARM 7 as the core controller in the smart vehicle to accomplish an ongoing operation framework (OS) RTOS. This controller acts as the control framework to work the whole vehicle.

[9]. this paper presents an application implemented on an Arduino development system using an ATMEGA 2560 microcontroller. The program controls ten outputs in sequential order and it is loaded onto the memory of the microcontroller. Each output is activated only when the system receives information about the previous command. These commands are highlighted by an optical LED display circuit which is provided with galvanic separation by opt couplers.

[10]. this work is focused on the development of a platform based on Android in order to interact with robotic systems based on an Arduino microcontroller. Nowadays, Arduino is an open microcontroller system which makes easy the control of home-made robots, which can be used to start students in robotics issues. Android, is an OS that is widely used in phones and tablets by students.

IV. Implementation

The system aims to provide a simple robotic hardware architecture so that this shape can be centered on a Bluetooth connection infrastructure. It is also beneficial for the academic system as humans can build their own personal robots with

less cost. When the app is working in the system, a microphone on the mobile is used to identify the user's voice commands. The commands are interpreted and the program uses Google's speech-recognition software to translate voice to text within the app. The text will then be sent to the receiver part with the help of bluetooth. Digital Arduino I/O pins 3, 4, 5 and 6 are programmed as output pins in this design. For serial communication with the bluetooth unit, pins 0 and 1 of the Arduino are used.

The TX, RX pins of the Arduino are connected to the Rx, Tx pins of the bluetooth module. The bluetooth module is supplied with 5V. Similarly, the left DC motor is connected to pins 3 and 6 of the L293D and the right DC motor is connected to pins 14 and 11 of the L293D. Arduino digital pins 2,3,4,5 are connected to L293D 2, 7, 10, 15 respectively.

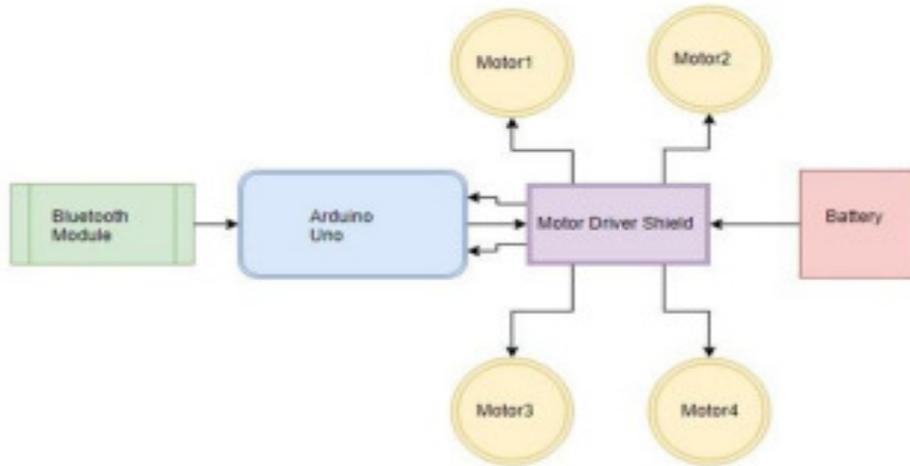


Fig7. Block Diagram of Voice Controlled System

As mentioned above, voice commands are processed by the phone, and speech-to-text conversion is done within the app using Google's speech-recognition technology. The text is then sent via Bluetooth to the receiver. The text received via Bluetooth is forwarded to the Arduino Uno board using the UART serial communication protocol. The Arduino code checks the received text. Whenever the text is a matching string, the Arduino controls the robot's movements according to Forward, Backward, Turn Right, Turn Left and Stop.

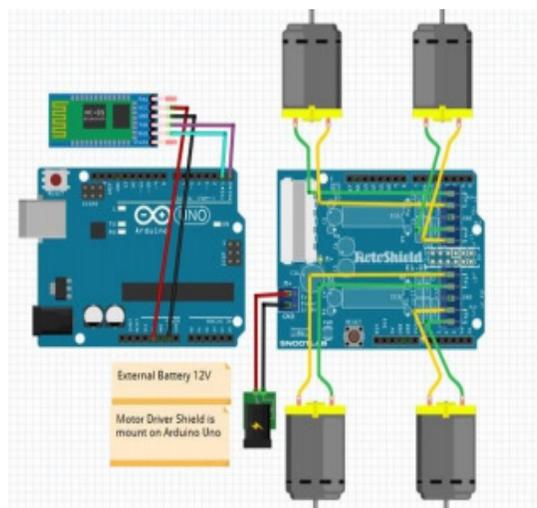
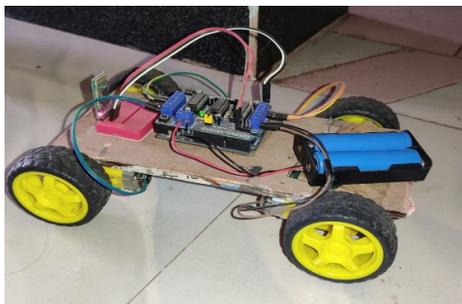


Fig8. Circuit Diagram of Voice Recognition System

Commands	Functions
1.Forward	Systems moves forwards
2.Backward	System moves backward
3.Left	Systems moves left
4.Right	Systems moves right

Upon successfully pairing the device, open the app on the smartphone and press on the Bluetooth .The number of associated gadgets will now be shown. Select HC-05 from the listing to join the smart phone with HC-05 Bluetooth module on the receiver side. After successful connection, ‘connected’ will be displayed on the primary screen of the Voice control app. Press the pushbutton with a microphone image and a prompt will show up asking for voice commands

V. RESULT



VI. CONCLUSION

The proposed framework of our project shows how the system can be controlled using BluetoothVoice controlling orders are effectively transmitted through Bluetooth innovation and desired activities take place effectively. This work minimizes human effort in places or situations where human intervention is troublesome. Such structures can be put to use on the spot, for example, for businesses, military and guards, investigative purposes, etc.

REFERENCES

- [1] Design of a Bluetooth Enabled Android Application for a Microcontroller Driven Robot By Vito M. Guardi, (May 2014).
- [2] Android Controlled Mobile Robot by Jorge Kazacos Winter, (July2013).
- [3] Android Based Robot Implementation For Pick and Retain of Objects By Ranjith Kumar Goud, B. Santhosh Kumar, (Oct 2014).
- [4] Smart phone based robotic control for surveillance applications By M.Selvam, (IJRET 2014)
- [5] Controlling a Robot using Android Interface and Voice by Kishan Raj KC, (2012).

[6]Voice Controlled Robotic Car Using Arduino for Smart Agriculture

Authors:D.SARAVANAN, R.PARTHIBAN,

[7]. Paper On Android Controlled Arduino Based Robot Car by Jorge Kazacos Winter

[8] Paper On Android Controlled Arduino Based Robot Car by Vito M Guardi