iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 **Issue:** V **Month of publication:** May 2019

DOI: https://doi.org/10.22214/ijraset.2019.5497

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.177
Volume 7 Issue V, May 2019- Available at www.ijraset.com

Implementation of Voice Controlled Robot using Arduino: A Novel Approach

Moloy Dhar[1], Mandira Banik[2], Biplab Roy[3], Neela chattopadhyay[4], Mriganavi Dutta[5], Ankan Goswami[6], Aindrilla Majumder[7], Mili Ghosh[8]
[1, 2, 3, 4, 5, 6, 7, 8]*Department of Computer Sc. & Engg., GNIT*

Abstract: The communication between the robot and the android application is carried over by the Bluetooth link between the phone's Bluetooth and the Bluetooth device in the Robot. The ASCII commands are sent from the phone to the Robot which in turn checked by the Arduino for the control of the wheels according to the commands to move the robot in the desired direction.
Keywords: voice, robot, Arduino

I. INTRODUCTION

Speech signals are the most important means of communication in human beings. Almost every conversation to interact is done by means of voice signals. Sounds and various speech signals can be converted into electrical form using a microphone. Voice recognition is a technology which is used to convert the speech signals into a computer text format. This voice recognition technology can be used to control and generate speech acknowledgement using some external server. Robot voice has the ability to understand thousands of voice commands and perform required action. The voice recognition is a bit difficult task because each person has his own accent. These robotic assistants can be used for shaping, manufacturing and tooling purposes in various sectors such as manufacturing, defence etc. In hospitals, these robotic assistant can be used for the purpose of performing surgeries and operations with high precision. In this paper, we develop an assistant robot that can be operated using speech commands.
The remainder of this paper is organized as follows.
Section II presents a survey of "state-of-the-art" frameworks and their limitations. Section III describes our proposed technique. Finally, Section IV discusses limitations and further work.

II. STATE OF THE ART

Our project is about voice control car that is controlling a car with the help a bluetooth module HC-05 which accept data and a smart phone which is used to send data. The app is a third party app developed in such a way that it convert the voice command to text and transfer the text to the connected Bluetooth device. The bluetooth connected on the Arduino board receives text from the Android app as characters and stored them as string to the assigned String. There are words pre-programmed (forward, reverse, right, left and stop) to the arduino, whenever the received text matches with the pre-programmed words ,the arduino executes the command that assigned to the words. Arduino can connect to Laptop to monitor serial communication and check the working process and the words received by the Bluetooth. As per the input arduino send the commands to the L298N motor driver in the form of digital signal. Then following those commands motor driver rotates the motors or the wheels of the car. Thus we can control a car with voice command.

A. Hardware Used In Robot Voice

Various types of hardware is used in the car. They are

1) *Arduino Uno:* The Arduino UNO is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It can be powered by a USB cable or by an external 9 volt battery, though it accepts voltages between 7 and 20 volts. It is also similar to the Arduino Nano and Leonardo. The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available. "Uno" means one in Italian and was chosen to mark the release of Arduino Software

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.177
Volume 7 Issue V, May 2019- Available at www.ijraset.com

(IDE) . The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform. The ATmega328 on the Arduino Uno comes with pre programmed with a boot loader that allows uploading new code to it without the use of an external hardware programmer. It communicates using the original STK500 protocol. The Uno also differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it uses the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

Fig. 1

2) *Bluetooth Module HC-05:* HC-05 is a Bluetooth module which is designed for wireless comunication. This module can be used in a master or slave configuration.

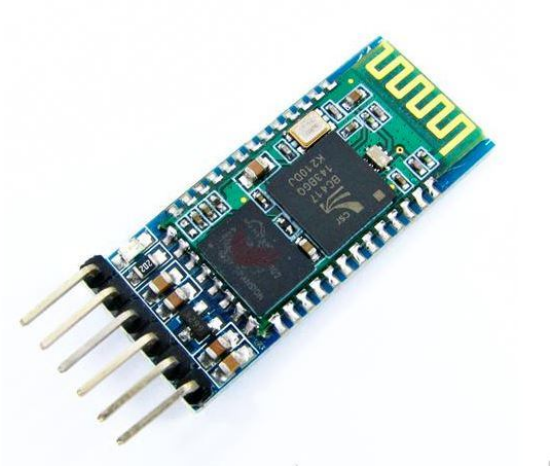


Fig. 2

a) HC-05 Module Information

i) HC-05 has red LED which indicates connection status, whether the Bluetooth is connected or not. Before connecting to HC-05 module this red LED blinks continuously in a periodic manner. When it gets connected to any other Bluetooth device, its blinking slows down to two seconds.

ii) This module works on 3.3 V. We can connect 5V supply voltage as well since the module has on board 5 to 3.3 V regulator.

iii) As HC-05 Bluetooth module has 3.3 V level for RX/TX and microcontroller can detect 3.3 V level, so, no need to shift transmit level of HC-05 module. But we need to shift the transmit voltage level from microcontroller to RX of HC-05 module.

3) *Motor Driver L298N Module:* The L298N is an integrated monolithic circuit in a 15- lead Multi watt and PowerSO20 packages. It is a high voltage , high current dual full-bridge driver de-signed to accept standard TTL logic level sand 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 in-put signals .The emitters of the lower transistors of each bridge are connected together rand 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.

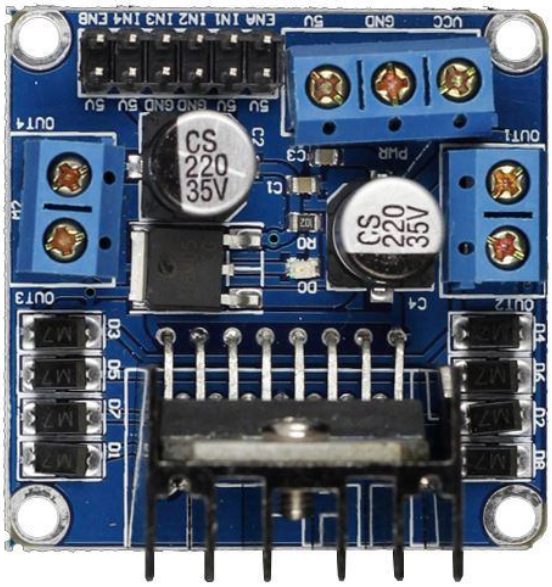


Fig. 3

a) Features

i) High operating voltage, which can be up to 40 volts;

ii) Large output current, the instantaneous peak current can be up to 3A

iii) With 25W rated power;

iv) Two built in H-bridge, high voltage, large current, full bridge driver, which can be used to drive DC motors, stepper motors, relay coils and other inductive loads.

v) Using standard logic level signal to control.

vi) Able to drive a two-phase stepper motor or four-phase stepper motor, and two-phase DC motors.

vii) Adopt a high-capacity filter capacitor and a freewheeling diode that protects devices in the circuit from being damaged by the reverse current of an inductive load, enhancing reliability

viii) The module can utilize the built-in stabilivolt tube 78M05 to obtain 5v from the power supply. But to protect the chip of the 78M05 from damage, when the drive voltage is greater than 12v, an external 5v logic supply should be used.

4) 12V dc Motor: A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor. DC motors were the first form of motor widely used, as they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances. The universal motor can operate on direct current but is a lightweight brushed motor used for portable power tools and appliances. Larger DC motors are currently used in propulsion of electric vehicles, elevator and hoists, and in drives for steel rolling mills. The advent of power electronics has made replacement of DC motors with AC motors possible in many applications.

III. CONCLUSIONS AND FUTURE WORK

This work has a vast field for expansion. The robot is small in size, so space required for it is small. We can access the robot from the distance of meters as we are using Wi-fi for the connection between robot and the server PC.

As we are using smart phone which is attach to the robot so it will capture video which will be used for security.

Cost of system is low as we are using smart phone which is nearby available to everyone.

REFERENCES

[1] Christie, Derek & Koymans, Anne & Chanard, Thierry & Lasgouttes, Jean-Marc & Kaufmann, Vincent. (2016). Pioneering Driverless Electric Vehicles in Europe: The City Automated Transport System (CATS)

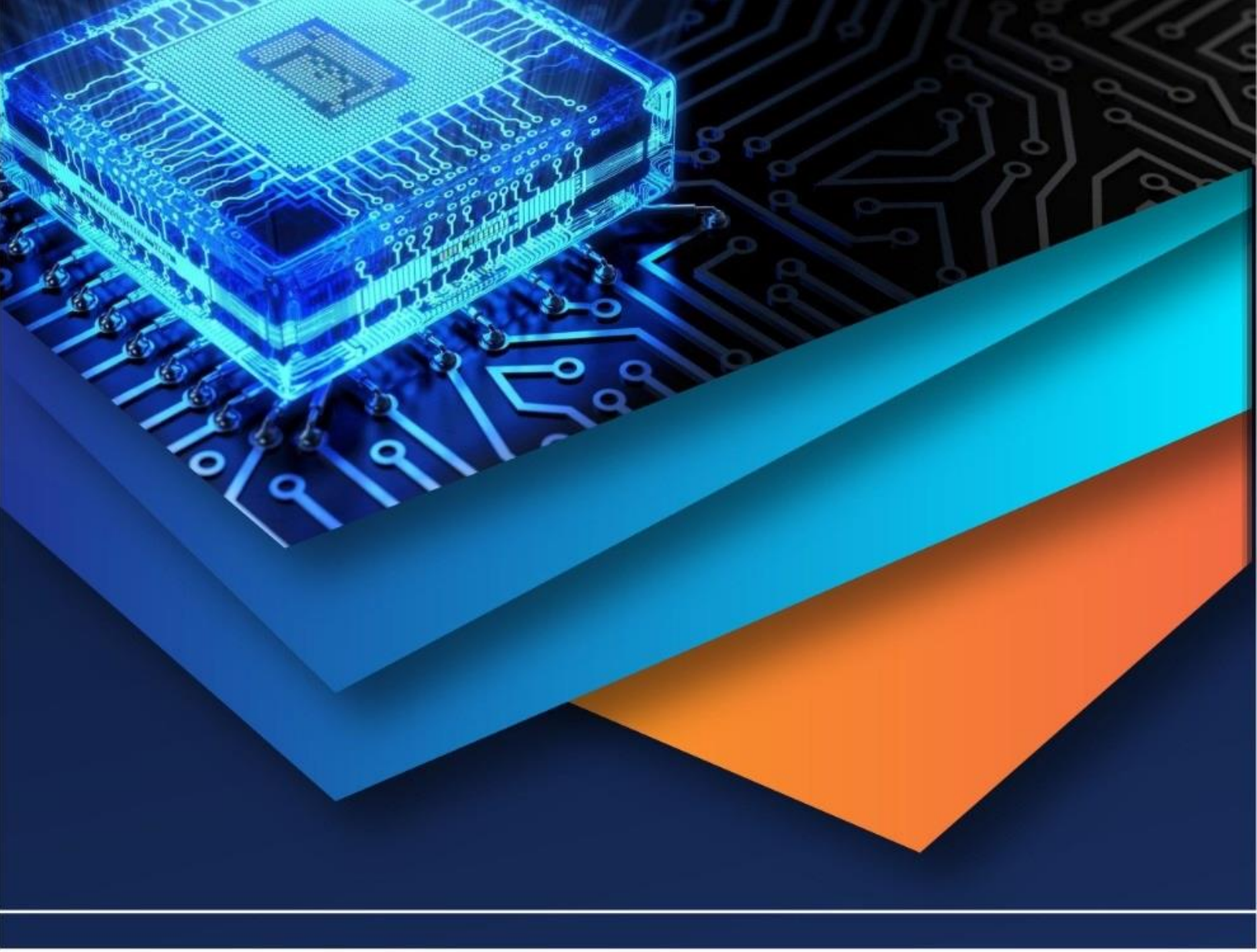
[2] Kohl, Christopher & Knigge, Marlene & Koleva, Galina & Böhm, Markus & Krcmar, Helmut. (2018). Anticipating acceptance of emerging technologies using twitter: the case of self-driving cars. Journal of Business Economics. 10.1007/s11573-018-0897-5.

[3] Pendleton, Scott & Uthaicharoenpong, Tawit & Jie Chong, Zhuang & Ming James Fu, Guo & Qin, Baixue & Liu, Wei & Shen, Xiaotong & Weng, Zhiyong & Kamin, Cody & Adam Ang, Mark & Tetsuya Kuwae, Lucas & Marczuk, Katarzyna & Andersen, Hans & Feng, Mengdan & Butron, Gregory & Chong, Zhuang Zhi & Jr, Marcelo & Frazzoli, Emilio & Rus, Daniela. 2015). Autonomous Golf Cars for Public Trial of Mobility-on-Demand Service. 10.1109/IROS.2015

[4] J. Haboucha, Chana & Ishaq, Robert & Shiftan, Yoram. (2017). User preferences regarding autonomous vehicles. Transportation Research Part C: Emerging Technologies. 78. 37-49. 10.1016/j.trc.2017.01.010.

[5] Szigeti, Szilárd & Csiszar, Csaba & Földes, Dávid. (2017). Information Management of Demand-responsive Mobility Service Based on Autonomous Vehicles. Procedia Engineering. 187. 483-491. 10.1016/j.proeng.2017.04.404.

[6] Monjezi Kouchak, Shokoufeh & Gaffar, Ashraf. (2018). Determinism in Future Cars: Why Autonomous Trucks are Easier. 10.1109/UIC-ATC.2017.8397598.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY