

Iot Based Speech Recognition Controlled Car using Arduino



R.Veeramani, R.Madhanmohan, Deepak Prajapati, Aman Kumar, Sidharth Kumar

Abstract: IOT based speech Controlled car is a mobile robot whose motions can be controlled by the user from remote place by giving specific predefined speech instruction through the mobile devices. Methodology used to processes the instruction is received by the mobile devices which is enabled with Bluetooth technology and speech can be processed by the speech recognition module of ARM. When an instruction for the car is identified, then voice module sends a command message to the Arduino, it will analyze the message and takes beneficial actions. The aim is to develop a walking car which is controlled by human speech and applied to the automation domain such as robotics, defence and virtual reality. When instructions are given on the bluetooth, the bluetooth module will take the voice commands and the voice commands into digital signals.

Keywords: ArduinoUNO, ARM, Motorsx2, Bluetooth HC-05, Breadboard.

I. INTRODUCTION

Nowadays smart things are very useful for communication, similar to in the world of automobile we need to implement something new which can be increase the smartness of the automobile. It will be very useful for the driving the automobile. Research project will be useful for the automobile to increase the smartness such that drivers can use their potential in a good manner. Speech recognition car will be very useful for the new era. Speech recognition [1] control car means it will be work according to human voice command. Voice module will be identify the human voice then according to the voice command robot will be react , so it is very useful for the parking. Usually park the car in the parking area and there is no space for opening the gate, at that time we can use our idea which is voice recognition system. With the help of automatic start feature we'll start our car after starting the car give the command according to our need (Left , Right , Forward , Back , stop).After giving the voice command the car will be come out from the congested are then we can easily open the car door. The command will be

given into the mobile app which is AMR voice after giving the command Bluetooth will receive the voice command and after receiving the voice command it will go to the Arduino UNO.[3] According to the v the motor driver according to the instruction motor driver will be rotate the wheel. If command will be left then for few second the left wheel will be stop and right wheel will be rotate. And for turn right for few second both right wheel will be stop and left wheel will be rotate. For forward all wheels will be rotate in forward direction and for back all the wheel will be rotate in the backward direction. [1]

A. Existing model

The existing model is based on microcontroller and bluetooth. Bluetooth devices use 2.4 to 2.5 GHz frequency for communication. There is too many control devices like speech recognition robot.[7]

B. Design

First of all connect the mobile bluetooth with bluetooth module. Once connection established give instruction to the bluetooth. After that Aurdino will take appropriate action according to our voice command.

II. SYSTEM MODEL

Model and its Parts:

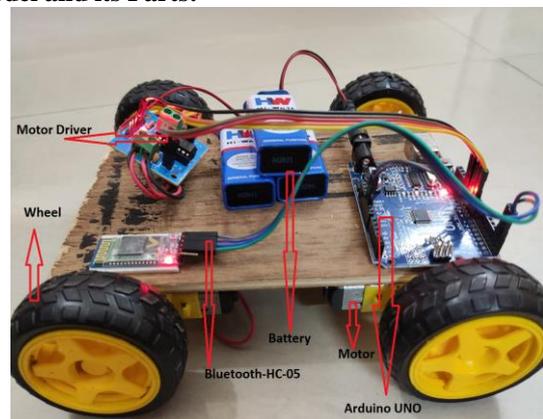


Fig.1 Miniature model of voice controlled Car

A. Motor driver

The model of the motor is L293D. The range of the voltage is 4.5 volt to 36 volt and output current is 600 mA. The peak output current is 1.2A.

Motor driver will work according to the instructions of the Arduino UNO.

B. Bluetooth

The model name of the Bluetooth is HC-05. It is IEEE 802.15.1 standardized protocol. There are many applications of the Bluetooth. It will receive the voice command from the mobile app and forward to the Arduino UNO.

Revised Manuscript Received on October 30, 2019.

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C. Arduino UNO

It is like a human brain. According to our need we programmed it. It is very useful for the project and hacking. We feed the code inside the arduino module with the help of IDE software. IDE software is a platform for the arduino programming. We install the code inside the arduino board with the help of USB cable. Arduino software IDE is an open source. The Arduino board is occupied with the circuit, USB port, input output port etc. There are many kinds of LED for giving signals to the user. It consists of different kinds of pins which play a key role for the input and output.[3]

D. Standard Commands

Forward is used to go forward.

Back is used for go back.

Left is used for go left.

Right is used to go right.

Stop is used to stop the car.

E. Pseudo Code

```
InitFlashASM();
```

```
    //Activate the system flash memory
```

```
InitI2CInterfaceASM();
```

```
    //Activate the push button controller
```

Launch "VDK multi-threads"(separate Process) to control various Process.

Thread1 - Captures And Then stores Batches of sound for analysis.

Thread2 - Analyse previous stored sound for possible "commands".

Thread3 - previous commands to send commands to control the car

Thread4 - Check evaluation buttons for "options"

Thread5 - etc[6]

F. Pin Description

Bluetooth has six pins, pulled low is used for disabled the connection. State pins act as a status of the indicator. If module is not connected then signals goes low. VCC is used for supply voltage as an input and GND is used for output for the signal circuit.[4]

G. Algorithm

STEP1 : Give command to the AMR voice app.

STEP2 : Bluetooth will receive the voice command.

STEP3 : Arduino will identify the voice command.

STEP4 : Motor driver will take the command from Arduino.

STEP5 : According to the command motor driver will rotate the wheel.

F. Arduino board



Fig.2 Arduino UNO module [5]

List of the Equipments :

- Arduino UNO
- Bluetooth HC-05
- Motor driver
- Jumper wire
- Chassis
- Wheel
- Power source

III. SYSTEM FLOW

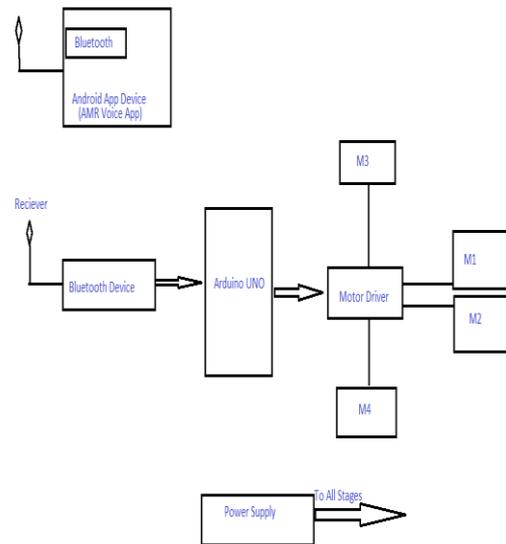


Fig 3. Flow of Command Execution

Flow diagram works from top to bottom, it gives a simple overview of the working principle. First, it consists of three phases. The first phase tells about mobile Bluetooth, and the second phase tells about the car Bluetooth antenna and other components. The third phase is all about power supply.[5]

A. Application and Objective

1. Reduce Parking problem.
2. It can be used in Defence.
3. It is used for Toys.
4. This system is useful in places where humans find difficult to reach.
5. It can be used for security system.
6. It is useful for disabled people.
7. Application of automation and robotics.
8. Telephone assistance system.
9. It can be used in virtual reality.
10. It can be used in different kinds of machines.

B. Features

- It can record 15 words per second.
- It uses low power.
- Long life
- User friendly
- High speed

IV. SPEECH RECOGNITION SYSTEM

It is similar to the Google assistant which is work accordingly user instructions. The icon of the AMR application is similar to the Google assistant. It is very simple to use. If we want to give instruction then press the voice icon and give command to the application. According to the command robot will take appropriate action.

V. CONSTRUCTION METHODOLOGY

Take a wood board and fix all the four motor with the help of glue gun. Link the wire with the help solder and test the motor, now take the Arduino board and install the code with the help of IDE software. Do not connect the bluetooth while installing the code. If we will connect bluetooth at the time of code installation bluetooth can be damaged. After installing the code connect the motor driver with Arduino. At last connect the bluetooth with Arduino.



Fig.4 Mobile module

A. Operational Principle

Speech recognition car is based upon voice command. First of all open the AMR voice application then connect the mobile Bluetooth to the Bluetooth module. When once connection will established press the voice icon and give command (Stop or Forward or Left or Right or Back).After giving the voice command to the bluetooth , it sends the voice command to the Arduino UNO and Arduino takes the command and gives instruction to the motor driver and motor driver perform the action according to the instruction. Wheels moves left , right , forward , back according to the instructions.[2]

VI. CONCLUSION AND FUTURE SCOPE

The conclusion is that we can control our car with the help of voice instruction. The voice instruction can be left, right, back and forward. If we talk about future scope then there are two main benefits, first is reducing of parking problem and second is we increase the range of communication so that we can easily communicate from large distance and also installation of camera to control other types of motions.

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