

Automated Voice Controlled Car using Arduino

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Abstract

This project was developed in a way that the robot is controlled by voice commands. An android application with a microcontroller is used for required tasks. The connection between the android app and the vehicle is facilitated with Bluetooth technology. The robot is controlled by buttons on the application or by spoken commands of the user. The movement of the robot is facilitated by the two dc servo motors connected with microcontroller at the receiver side. The commands from the application is converted in to digital signals by the Bluetooth RF transmitter for an appropriate range (about 100 meters) to the robot. At the receiver end the data gets decoded by the receiver and is fed to the microcontroller which drives the DC motors for the necessary work. The aim of Voice Controlled Robotic Vehicle is to perform the required task by listening to the commands of the user. A prior preparatory session is needed for the smooth operation the robot by the user. For the same a code is used for giving instruction to the controller.

Keywords: *Robot, Design, Fabrication, Sensor, Automation*

INTRODUCTION

Our aim is to make a robot vehicle which can be controlled by the voice command of a Person. Normally these types of systems are called as Speech Controlled

Automation System (SCAS). Our design is a prototype of the above mentioned system. The idea is to create a sort of robot which going to be driven by voice commands. The robot is remotely

controlled by a mobile phone; there are many articles that show the communication between a robot and smart phone. Smart phone is a very good interface for remotely automating the robot. It contains many features that can be helpful. In this design, an android application with a micro controller is used for the required task. The connection between the application and the robot is facilitate with Bluetooth Technology. The commands issued will be relayed over through the channel and will be received by the module. The objective of voice controlled robotic vehicle (VCRV) is to listen and act on the commands of the user. Here the system requires accent training,

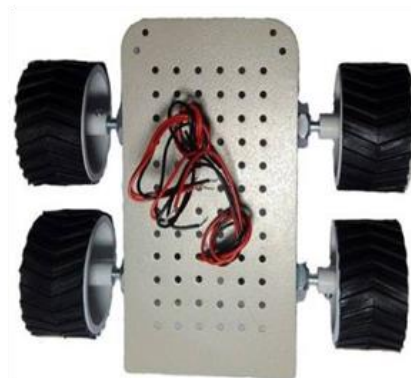
post which the device will start understanding the commands issued; and the commands have been added by codes.

Materials and Methods (Heading²)

Modeling and designing of the VCRV was done by the following part available in the market and also the programming of the arduino was done and the app was developed by using app inventor on the internet.

Chassis

The chassis is used to give a strong support. And it is the best for the voice controlled car; it is strong for the car.



Gear Motor



A DC motor is a class of rotary electrical machine that converts direct current into mechanical energy. All types of DC motors have some kind of internal mechanism either electronic or electro mechanical, so it can change the direction of flow of current in path of motor periodically.

Arduino UNO

Arduino UNO is an open source micro controller board placed on the micro chip ATmega328p micro controller and developed by Arduino.cc. The board has 6 Analog pins, 14 digital pins programmable with Arduino IDE via a Type B USB cable. It can power by external main volt battery.



L298D Motor Driver



The L298 Driver is a high voltage high current dual bridge driver designed to accept standard TTL Logic levels and drive inductive loads. The emitter of the lower level transistors of each bridge are connected together to the corresponding external terminal can be used for the connection of an external sensing resistor Figure 5. Shows the L298D Motor Driver.



MIT Application

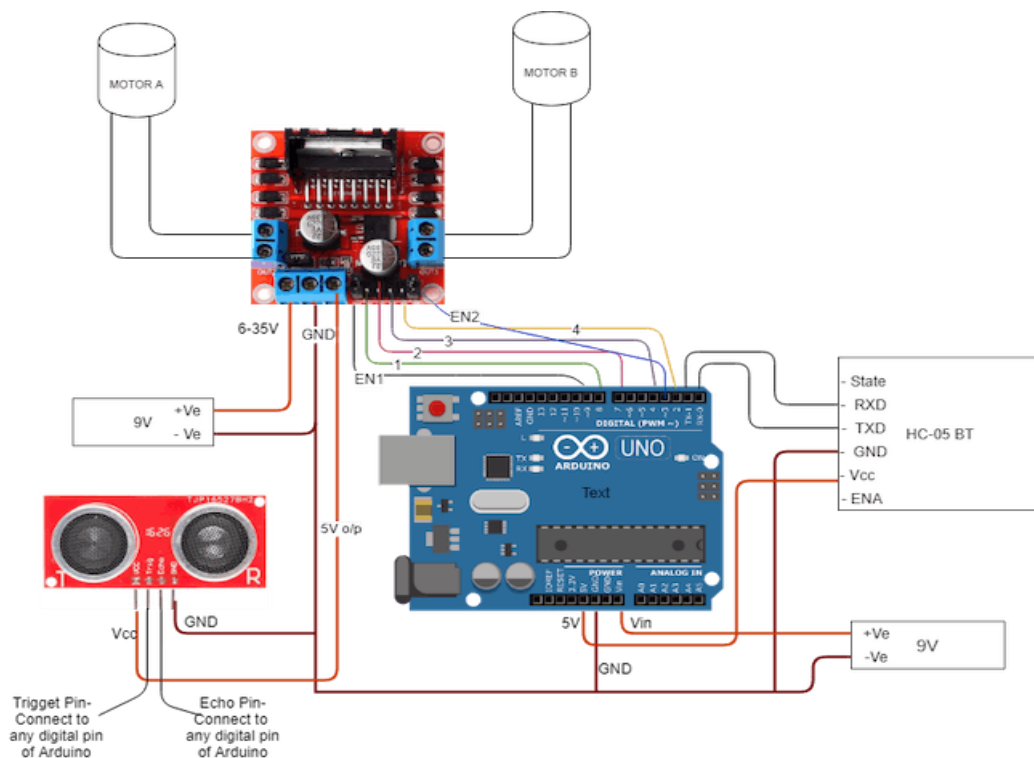
The application to control the vehicle was coded and created using app available on the Google play store known as MIT AI2 Companion. This app was developed by MIT Figure 7. Shows MIT AI2 App.

HC 05 Bluetooth Module

HC05 module is a simple Bluetooth module is a simple Bluetooth serial port protocol module designed for wireless serial connection setup. It has a footprint as small as 12.7mm X 27mm. It will simplify the overall design cycle.

Circuit Diagram

The block diagram of the voice controlled robotic vehicle is as follows. The Figure 9. Shows the connections in the circuit are made as per the following diagram.



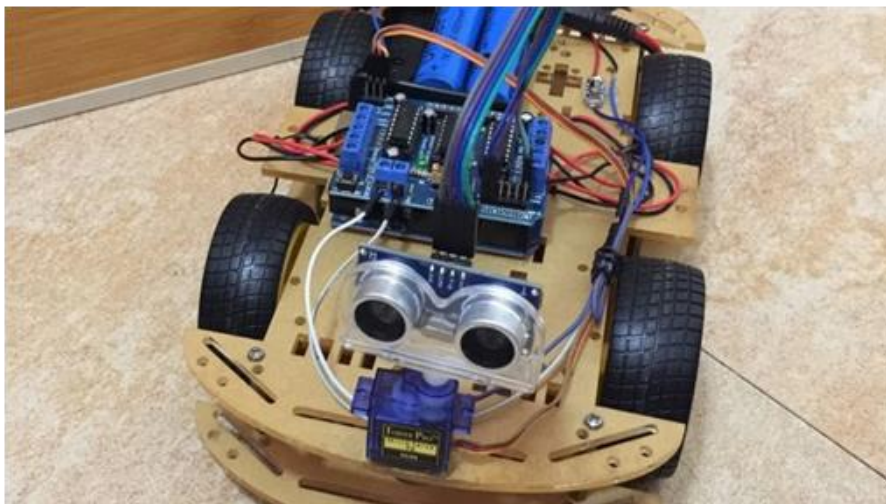
Result and Discussion

Human voice is identified using a microphone in the android smart phone. This voice is analyzed and converted into English words using the android operating system codes and Artificial Intelligence software. Speech recognition is the inter-disciplinary sub-field of computational linguistics that develops methodologies and technologies that enables the recognition and translation of spoken language into text by computers. It is also known as automatic speech recognition (ASR), computer speech recognition or speech to text (STT). It incorporates knowledge and research in the linguistics, computer science, and electrical engineering fields. From the technology perspective, speech recognition has a long history with several waves of major innovations. Most recently, the field has benefited from advances in deep

learning and big data. The advances are evidenced not only by the surge of academic papers published in the field, but more importantly by the worldwide industry adoption of a variety of deep learning methods in designing and deploying speech recognition systems.

Figure shows the assembly image for voice control robot using Arduino software. The project was completed according to the specification and needs. Simple movements can be controlled with the voice.

The proposed system is basically based on Voice Controlled Robotic Vehicle helps to control robot through voice commands received via android application. The Voice Controlled Vehicle is controlled through voice commands given by the user who is operating the project.



These voice command needs to be given through an android app which is installed on the user's android mobile. Speech recognition is done within the android app and then a respective command is sent to the voice-controlled robot vehicle. Microcontroller fitted on the Vehicle decodes these commands and gives an appropriate command to the motors connected to the vehicle.

The project has several advantages and some of the discussed below:

- It can be developed into a real-world vehicle for transportation purpose.
- The robotic vehicle can be used where humans find difficult to reach but human voice reaches like in a small pipeline, in fire situations, in highly toxic areas Etc.
- It can be integrated with wheelchairs for assisting disabled persons.
- It can be used to bring and place small objects.
- In military applications such as observation of enemy camp using cameras

CONCLUSION

The "Voice Controlled Robotic Vehicle" project has many applications and in present and future. The project can be made more effective by adding features to

it in the future. The project has applications in wide variety of areas such as military, home security, rescue missions, industries, medical assistance etc. We were successful in implementing a simple model of voice controlled robotic vehicle using the available resources. The implementation of this project is easy, so this robot is beneficial for human life. The Voice Control Robot is useful for disabled people and monitoring purpose. It works on simple voice command, so it is easy to use. It is useful for those areas where humans can't reach. The size of this robot is small, so we can use this robot for spying purpose. It can be used for surveillance. We can implement web cam in this robot for security purpose. The voice recognition software has accuracy and for identifies a voice command and it is also highly sensitive to the surrounding noise

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