# Voice Controlled Robotic Car

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**ABSTRACT:-**

Today's world requires more technological developments to improve their work from the place where they are so that the project is developed based on robot is controlled by the voice commands. It establishes the connection between android application and car with the help of blue tooth module. The robot is commanded with the buttons on applications or with the spoken words of users. The robot is controlled by two dc servo motors and microcontroller at receiver side. The command from application is converted into digital signal in an appropriate range that covers the robot using Bluetooth RF transmitter (a typical range is around 100m). The data gets decoded at receiver end and it gives back to microcontroller to control the function of DC motor. The ultimate destination of this project is to control the robotic car by listening to the words of commands.

*Keywords—Microcontroller, Design, Automation, technology, Bluetooth Module, Motor driver.*

## 1. INTRODUCTION :-

The commands that come through the voice makes it more simple to implement this project to the real world applications. The system used in this project is named as Speech Automation System (SCAS). The main idea is that , to implement a robot that is controlled by voice commands. The robot is controlled at the distance using mobile phone. For the automation of robot mobile phone plays a major role as it contains many applications.

The two major components of this design is microcontroller and android applications. Bluetooth helps to establish connection between applications and robot. The module receives the commands given by users over through the channels The functionality of robotic car is to listening to the command and act accordingly. A Voice controlled robotic vehicle is for analyse the voice and performs based on it . Forward, Backward, Right, left are the basic commands. In the present world Vehicles are controlled manually by applying brakes, acceleration and shifting gears. Nowadays technologies were deployed on conventional vehicles to be better performed as a new vehicle. In earlier periods robots were controlled manually but now it is facilitated using voice and gestures. This technology is explained by the interactions between computer and human beings. The advanced mobile phone is better to proceed with this type of technology as it supports the day today technological developments. The project is used in many applications as one to move a wheel chair only by using commands makes it easy for them instead of controlling it manually but also it avoids obstacles on their way and informs to user. In case of occurring danger it immediately pretend to the registered mobile number. The hardware components involves mechanical works of robots, the movement and motions of the motor drives the robot on its way, Software specifications drives to move robot along with its deliberate algorithms to convert desired words.

Personal robotic assistants deploys functionality that reduces the manual control of human beings. Intelligent Personal Assistant (IPA) can produce numerous tasks for a person. This paper explains the hardware components that includes implementation of face, object, speech. The speech in a form of signal is converted into text format using a Bluetooth network. The first step that involves feature extraction. Mel Frequency Cepstrum helps to extract some facial expression and time Warping technique is used for expression matching. The major component for the overall functionality is that Arduino to abstract speech signal and conveying the same to be as text at receiver end. Whole performance is based on the component called Arduino. Hand gesture works wirelessly depending on radio frequency which relays upon Bluetooth network. The voice command is converted into text format only through

Bluetooth network. The robot will looks upon an object near to it with the help of camera attached to it. The distance between the object and robot is measured.

1. **HARDWARE AND SOFTWARE REQUIREMENTS:-**

A. Hardware Components

1. Arduino UNO
2. Ada Fruit Motor Drive
3. Bluetooth Module
4. DC Motor
5. Wheels

B. Software Components

1. Arduino IDE software
2. MIT A12 Companion

### 3. HARDWARE DESCRIPTION:-

The project contains robot voice control software and main window should be displayed. The movement of robot depends on compiling a library of IOP conf. series. A sequence of actions is provided, that is following operator. In this project the implementation of robot includes android applications connected with Bluetooth module along with Arduino device. These kind of project is being very useful in the situation in which humans cant enter or involving to pretend to do some tasks.*Design of this project is with various components available in shops and also include programming of Arduino. The app should be designed for maintaining the control of robotic car using invertor on internet.*

First of all a framework should be built over in order to make skeleton structure for our project. A geared motor that converts DC to mechanical energy. The wheels should be placed in such a way that it much perform rotatory motion when it placed in an horizontal axis makes it possible for transmission.

#### A. Arduino UNO

Arduino UNO is a micro chip that is being used to perform action that is implemented by feeding code using Arduino software, It is powered by main volt battery. The Arduino checks that the text is received and does it exist as a matching string. Arduino controls the movement of robot in forward, backward, right turn, Left and stop.



Figure1: Arduino UNO Microcontroller.

#### B. L293D Motor Driver Shield

L298D motor driver it is designed to receive standard TTL logic levels. It is a high-voltage, high-current bridge driver. Each low-level transistors emitters are connected to the external terminal.
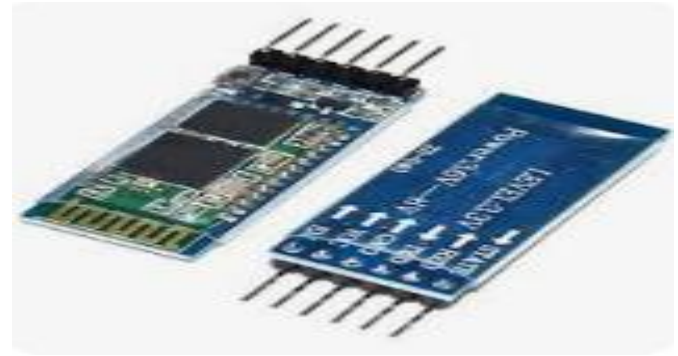


Figure2: L293D Motor Drive Shield.

#### C. Bluetooth module HC05

HC05 Bluetooth module is a simple port protocol module to establish wireless connection setup. It has Modest footprint of 12.7mmx27mm. It enables connection between Picobricks and a mobile phone wirelessly. The command given will be transferred via Bluetooth, as it controls car according to the data.

#### D. Motor

Each DC motor has internal electronic and electromechanical, that enable to changes current flow on periodic basis. It helps for the locomotion by which it acts according to the microcontroller in order to move vehicle in every direction. The communication between android device and that to the receiver is sent like serial communication.
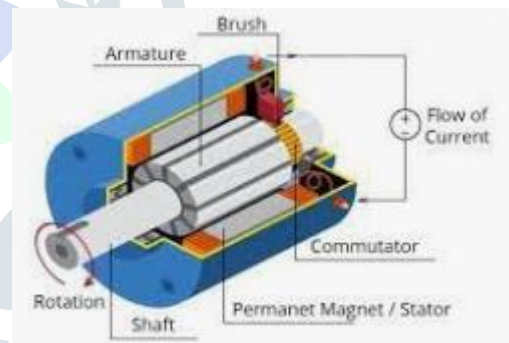


Figure3: DC Motor.

#### E. Wheels

The hard material that put on axil and moves when moment gets imposed by torque.



Figure4: Wheels.

### 4. SOFTWARE DESCRIPTION:-

The application for controlling and maintaining car is available on play store called as MIT AI2. In this app we register

with essential details and named as of mentioned in id. This app contains accessed towards Bluetooth that connects Bluetooth option on mobile. Rating an app that is being named as AMR VOICE, It has some ability to view connection to Bluetooth and phone's Bluetooth settings.

Arduino software(IDE) has text editor for text typing, a console and it consists on various tools for compiling code and debugging the same in case of finding errors, This type of editing program using Arduino IDE is known as sketches. The Arduino UNO contains 6 analogue pins and 4 digital pins and feeding program is with help of IDE.
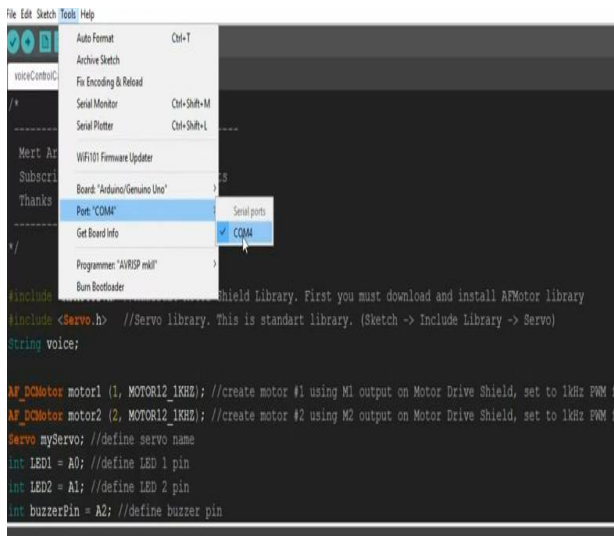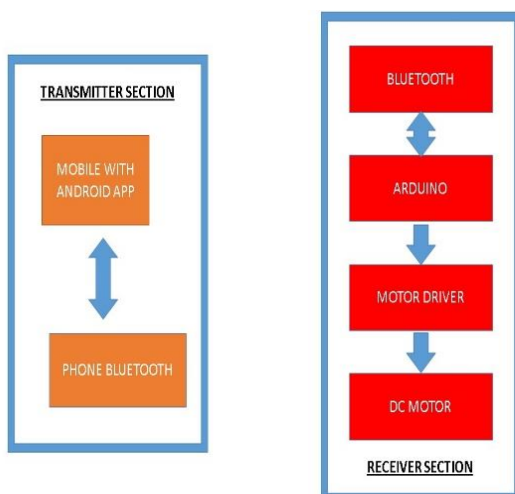


Figure5 : Arduino Software.



Figure6 : Working Model.

## 5. BLOCK DIAGRAM:-



## 6. WORKING:-

The smart phone is used to listen to the voice of humans, Using android operating system and AI , The voice is converted and transformed into English. Speech is the technology that makes the computer to recognise language into text. The STT(speech to Text Application Programming Interface), has of many names that comes as Automatic speech recognition(ASR), Speech to text etc. The transmitters uses android application for transmitting the data. At the receiver end reads the command and intend to control robotic car. The command is processed by mobile and speech-to-text conversion is made. The text is then transferred to receiver end using Bluetooth. The Arduino board will receive the text format using UART serial communication protocol. If the text matches with the string then Arduino controls the robot in Forward, backward and turn. Through the app installed on mobile it is possible to give commands to control robot at specific locations, A Bluetooth device receives commands and sent them to Arduino and thus the car moves. As this robotic car consists of both section one is transmitter and a receiver section.
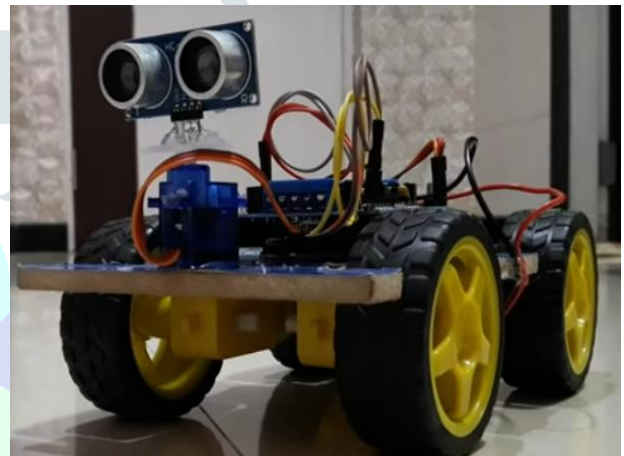


Figure7 : Implemented Model.

## 7. RESULT AND DISCUSSION:-

After The microphone is used in recognising human voice, Using operating system of android and with the help of AI software the voice is processed into English words. In computational linguistics speech recognition is one of multidisciplinary activity that explores the approaches what computer does to convert languages into text. STT blends languages, computer science, and electric engineering study. In terms of technology speech recognition has history in terms of technology. Deep learning and big data has its advanced development in today technologies. The growth of industries are the main reason to spread development of voice recognition system. The project was built based on requirements and specifications. By simple movement the voice can be controlled. It works on the influence of voice instructions provided to Android application. From the technology point of view long history is made by several improvement of innovations. Project based on voice recognition has benefited from advances in deep learning and big data. The world factories have deployed deep learning in design and working of speech recognition system. The project is developed according to needs and development of an individuals. Simple movements controlled by voice. Robots can be controlled based on voice command given by android applications downloaded on user's android mobile. Voice recognition is done within app and given towards voice

controlled robotic car, and is given to motor connected to the robot.

## 8. CONCLUSION:-

The project named Voice Controlled Robotic Car has useful in the fullest in present as well as in future. Further improvement can be made to make it more efficient. In military purpose it has some major advantages and also in medicine. This project requires various resources to built and simple to implement with using limited resources. This project is portable in size and is useful for monitoring threats and in case of surveillance. The voice recognition allowed to predict and differentiate between actual voice from background voice.

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