# Voice Control Car Using Arduino And Bluetooth Module

**Buvashid Chavan[1], Payal Sutar[2], Siddhi Londhe[3], Ashwini Suryavanshi[4], R.S. Mahale[5]**
[1, 2,3 , 4, 5] Dept of Electronics & Telecommunication Engineering
[1, 2, 3, 4, 5] JSPM, RSCOE, POLYTECHNIC TATHAWADE PUNE MAHARASHTRA, INDIA

***Abstract-*** *With The Help Of Speech Commands, This Project Creates A Voice-Controlled Car That Responds To The Appropriate Spoken Command. However, Additional Research Is Necessary For Handling Noise And Distance. To Operate The Car, Simple Voice Commands Like Forward, Backward, And Stop Are Employed. An Android Application Is Used To Instruct The Bluetooth Module With These Commands. To Save And Test The Voice Commands, The Bluetooth Module And Control Unit Are Combined. A Command Message Is Transmitted By The Bluetooth Device To Arduino UNO, The Car's Microcontroller, When An Instruction For The Vehicle (Car) Is Recognised. The Microcontroller Examines This Command And Executes It. Image Processing Can Be Used In The Car To Recognise The Barriers And The Shade.This Work Is Only Capable Of Short-Range (10 Mts) Communication And Is Connected To The Vehicle Across Large Distances Via Long-Range Modules.*

***Keywords***- Arduino UNO, Bluetooth Module, Speech Recognition.

## I. INTRODUCTION

This Project Voice Controlled Robotic Vehicle Helps To Control Robot Through Voice Commands Received Via Android Application. The Integration Of Control Unit With Bluetooth Device Is Done To Capture And Read The Voice Commands. The Robotic Vehicle Then Operates As Per The Command Received Via Android Application Or Bluettoth Module. Our Goal Is To Create A Robot Car That Can Be Operated By A Person's Voice Command. These Systems Are Sometimes Referred To As Speech Controlled Automation Systems (SCAS) . The Above-Mentioned System Is A Prototype Of Our Design. The Concept Is To Build A Robot That Will Be Controlled By Voice Instructions. A Mobile Phone Is Used To Control The Robot; There Are Numerous Publications That Demonstrate The Communication Between A Robot And A Smart Phone. For Remotely Automating The Robot, A Smart Phone Is An Excellent Interface. It Has A Lot Of Features That Can Be Useful.

- **Voice And Speech**

A Living Thing's Voice Is A Sound That It Makes. Lungs Supply The Airflow Used For Voice. Air Applies Pressure To Vibrating Vocal Folds. By Leveraging Our Neck, Chest, And Abdomen, We May Transform The Whisper That Speech Normally Makes In Our Throat Into Our Speech. Every Person's Speech Is Distinctive, And It Also Aids In Understanding Personalities, Moods, And Most Crucially, Communication Between Individuals. Mechanical Waves Use Vibration To Transmit Their Energy From One Medium To Another. A Hardware Component Called A Microphone Can Transform Analogue Input Into Digital Output. Computers Are Capable Of Comprehending, Modifying, And Storing Digital Data. The Use Of Some Sophisticated Algorithms And Accurate Dictionaries For These Algorithms Allows Computers To Recognise Speech. Some Systems Employ These Two Methods Along With The Techniques Of Frequency Spectrum Decomposition, The Hidden Markov Model (HMM), And The Mel Frequency Cepstral Coefficients (MFCC).

### B. Arduino Communication

To Communicate With Arduino We First Need To Install Its Free Software From The Internet And Install. The Software Is Very Easy To Use And Installing It Creates Just One .Uno Files On The Microprocessors These Files Confuse The User Because There Are Many Different Files Generating. After Installing Arduino It Is Ready To Usage Including Dictionaries Using Dictionaries Is Very Easy On The Arduino And Arduino Does Not Requires Any Configuration Setting When Programming. UserCan Use USB Cable To Connect Arduino And After That User Can Dump His Code To Arduino Far More Easily And Quickly Than Micro-Controller.

- **Bluetooth Communication**

Bluetooth Is One Of The Popular Devices To Communicate In Short Range It Is Used On Computers, Cell Phones, Head Phones And Many Other Devices. Bluetooth Devices Use 2.4 To 2.5 Ghz Frequency To Communicate With Each Other. Bluetooth Devices Generally Use Frequency-Hopping Spread

Spectrum Communication Technique To Communicate With Each Other.

In Our Project We E Bluetooth Module HC-06.

## II. EXISTING SYSTEM

The Current Systems Are Robots Like Line Follower Robot, Edge Averting Robot, DTMF Robot, Gesture Controlled Robot. These Type Of Robots Are Not Efficient Since They Require More Power To Run, Cost Is Also Very High. In The Existing System They Don't Use Voice Commands, Making It Not Possible For Physically Handicapped People To Drive. The Voice Commands Are Interpreted Via An Offline Server In Real Time. The Commands Are At Once Transmitted To The Server Directly By The Means Of A Wired Network. The Car Is Built Primarily On A Platform Based On A Microcontroller. SomeOf The Fields That Can Likewise Be Equally Enhanced Are The Effect Of The Mouth-Microphone Range On The Robotic, The Overall Performance (Scope) Of The Robot And The Effect Of Noise On The Translation Of Speech To Textual Content. In The Existing System Bitvoicer Server Is Used, It's A Database For Speech Processing And Automation Synthesis. It Was Designed To Make Voice Operation Possible With Simple Gadgets Having Low Processing Power. Microcontrollers Usually Do Not Have Enough Storage And Computing Ability To Perform Sophisticated Speech Treatment And Synthesis. By Doing The Tough Work Bitvoicer Server Removes The Consequences Of These Limitations So That The Microcontroller Can Assign Its Key Functionality To Most Of Its Origin Sources.

## III. PROPOSED SYSTEM

In This Proposed Device We Perform A Variety Of Research On Control Style Variants For Robots. It Shows That It's Feasible To Study To Successfully Manipulate Actual World Objects With Voice (Human Voice) As A Control Mechanism. The Reason Of This Lookup Is To Provide Simple Robotic Hardware Architecture So That This Shape Can Focal Point On Bluetooth Connection Infrastructure.When The App Is Operating In The System, A Microphone On The Mobile Is Used To Identify User Voice Commands. Commands Are Interpreted And The Program Utilizes Google's Speech-Recognition Software To Translate Voice To Text Within The App. The Text Will Then Be Sent With The Help Of Bluetooth To The Receiver Part. The Microcontroller Arduino UNO Has 32kb Of ISP Flash Memory, 2kb Of RAM And 1kb Of EEPROM. The Panel Incorporates Serial Communication Connectivity With UART, SPI And I2C. The MCU Will Operate At 16mhz Clock Speed. The 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 Arduino Are Used. Text Obtained With The Aid Of Bluetooth Is Forwarded To Arduino UNO Microcontroller Panel By The Usage Of UART Serial Conversation Protocol. Table 3.1 Displays The Voice Commands Used To Monitor The Robots And Their Functions.

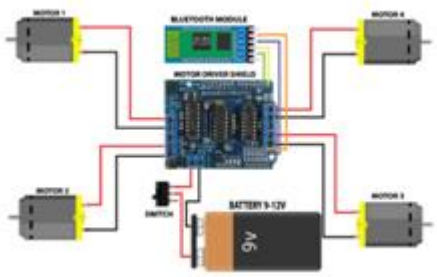


**Fig. Circuit Diagram**

**Voice Command Functions**

| Voice Command | Function |
|---|---|
| Forward | Both Moves Forward |
| Backward | Both Moves Backward |

The Voice Commands To The Robotic Device Are Dispatched Via Bluetooth With The Help Of An Android Device. These Commands Are Received On The Robotic Device By Using Bluetooth Module Set Up On It. The Complete Circuitry Is Powered By The Usage Of A 12V Rechargeable Battery Hooked Up On The System.

**Testing**

Open The App On Your Smartphone And Tap The Bluetooth Textual And Representative Micro Phone Button Once The Device Has Been Successfully Paired. Now The Number Of Connected Devices Will Be Displayed. To Connect The Smartphone With The HC-06 Bluetooth Module On The Receiver Side, Select HC-06 From The List. 'Connected' Will Be Shown On The Voice Control App's Home Screen Following A Successful Connection. When You Press The Microphone Button With The Microphone Icon, A Prompt Asking For Voice Instructions Will Appear.

When It Does, The Software Detects The Voice Commands And Turns Them Into Text Before Sending Them Wirelessly Via Bluetooth To The Receiver Part. The Text Is Examined By Arduino On The Receiving End. If The String Matches, It Directs The Robot To Move In Line With The Description.

## IV. RESULTS

- The Voice-Controlled Automobile Is Functional, And The Bot Carries Out All Of Its Duties.
- The Automobile Is Wirelessly Connected To The Mobile Phone, Making It More Convenient For The User To Control The Vehicle Than The DTMF Robot Is.
- The Line Follower Robot Only Travels Along A Specific Path; If An Obstruction Is In Its Way, It Will Not Proceed Until The Obstruction Is Eliminated.
- Using Google's Speech Recognition Technology Rather Of An Offline AMR Voice Server Allows For Voice Input In A Variety Of Languages.


**Fig:- Bluetooth Connected Fig;- Output**

## V. FUTURE SCOPE

This Experiment Was Limited To A Brief Zigbee Device (Range 100 Meters),And Is Linked To The Car Over Long Distance Via Long-Range Modules. Sleep And Wake-Up Routines May Be Enforced For Energy Enhancement. In The Vehicle, Image Processing Can Be Utilized To Become Aware Of The Shade And The Obstacles. For Additional Proper Service Servo Motors Can Be Deployed. A Robot May Include An Automated Targeting System To Monitor The Aim.

## VI. CONCLUSION

In This Project The Voice Control Was Designed For A Hoe Assistant Robot. The Order Of Speech Signals Is Automatically Transmitted Via A Wired Network To The Server. The Car Is Built Primarily On A Platform Based On A Microcontroller. Evaluation Of The Output Of The Original Tests Is Carried Out With Promising Implications. Possible Developments To Feasible Technologies In Households, Schools, Vehicle Networks And Businesses Are Also Addressed. Several Areas That May Additionally Be Discussed Are The Impact Of Noise On Speech To Textual Content Translation. The Accent Of The Speaker No Longer Affects The Robotic Activity Because Speech Commands Are Interpreted Using A Cloud-Based Server That Works Independently Of The Speaker Accent. The Use Of Renewable Energy Sources For Robotic Operation Would Not Only Increase The Value Of Robotic Energy, But Would Also Be Environmentally Friendly. Solar Cells Can Be A Suitable Power Source To use. The design of the robotic assistant is ideal for applications ranging from chemical manufacturing to comfortable home circumstances. Accuracy of detecting a voice command correctly is found to be 75%.

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