

# Voice Controlled Car based on Arduino

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**Abstract**— Voice controlled automobile system is unbelievably useful in areas where there is high risk for humans to enter. Voice controlled automobile system is controlled through voice commands received via automaton device. The dominant unit with Bluetooth device is achieved using a Bluetooth module to scan and capture the voice commands.

The robotic vehicle operates by the commands received via automaton device, for the Arduino that's integrated at intervals the system. To dominant the device it ought to be any smart phone or the opposite automaton OS. The transmitter uses as associate automaton application is required for causing the given information. The receiver end reads these commands and interprets them into dominant the robotic vehicle. The automaton device will send commands to the vehicle to maneuver mechanism in forward, backward, right and left directions.

After receiving the commands, Arduino will operate the motors to maneuver the vehicle in given directions. The communication between receiver associated automaton device is shipped as Associate in Nursing serial communication information. Arduino program is meant to maneuver the motor through a motor driver circuit as per the commands sent by automaton device. Associate obstacle detector is alternative to guard the system from obstacles on the way by practice associate inaudible detector.

**Keywords:**- Arduino Uno (Microcontroller), Motor driver, Bluetooth Module.

## I. INTRODUCTION

We square measure currently living within the twenty first century. sensible phone has become the foremost helpful and essential factor in our existence and routine. humanoid application primarily based sensible phones have become a lot of powerful and equipped with many accessories and functions that square measure helpful for Robots. This project describes the due to management a mechanism via voice commands victimisation mobile through Bluetooth communication device, some options concerning Bluetooth technology, parts of the mobile and

mechanism. we tend to gift a review of mechanisms controlled by mobile via moving the robot upward, backward, left and right aspect by the humanoid application like Arduino, Bluetooth. individuals has modified with the victimisation of Bluetooth devices at workplace or home, and also the wired digital devices transferred into wireless devices. Here, we tend to square measure victimisation humanoid application, interface microcontroller and Bluetooth communication device. we tend to square measure victimisation Arduino software system to act and interface the Bluetooth module with the assistance of microcontroller. per commands received mechanism motion is controlled from the humanoid device. We tend to derived easy solutions to supply a framework for building robots with terribly low price however with high computation and sensing capabilities provided by the sensible phone that is used as an effect device.

Android application primarily based Bluetooth controlled robotic automobile. Our main catchword of project is to regulate the robotic automobile with humanoid application. Here we tend to use primarily Arduino UNO (ATMEGA 32), Bluetooth module (HC-05). we tend to interface the Bluetooth module with the system so as that we'll simply management the system by sensible phone application. This project is a lot of necessary to the modern society in context of spying and police work. Our project aims is to style a Robotic automobile that may be operate by victimisation humanoid device. The dominant of the mechanism is completed wirelessly through humanoid sensible phone victimisation the Bluetooth feature gift in it. Here among the project the humanoid sensible phone is utilized as a distant management for operational the mechanism. The dominant device of the complete system could also be a Microcontroller. Bluetooth module, DC motors square measure interfaced to the Microcontroller. the information received by the Bluetooth module from humanoid sensible phone is fed as input to the controller. The controller acts consequently on the DC motors of the mechanism. In achieving the task the controller is loaded with a program written victimisation Embedded 'C' language.

## II. OUR WORK

This project of ours is dominant automobile not by employing a sensors or transmitter however mistreatment Bluetooth that may be a terribly straightforward communication medium within the gift day. The remote during this project is associate humanoid device that has associate intrinsic Bluetooth module. The Bluetooth may be a serial communication medium through that we will connect 2 devices. Here we've got inserted a Bluetooth module that gets connected to the phone's Bluetooth, permits[that permits[that enables} U.S. to speak and allows to require command over it.

The Bluetooth module doesn't work on its own in dominant the automobile. the most half in dominant the automobile is vie by the Arduino UNO that homes the micro-controller ATMEGA32. Arduino has vie a serious role within the robotic section and has created it easier to convert digital and analog signal to physical movements.

The project is Bluetooth based mostly as a result of it offers U.S. wider vary of management and additional potency. It conjointly offers U.S. the advantage of adjusting the remote anytime, that means that we will use any humanoid devices as well as phones, tablets, computers. Physical barriers like walls, doors, etc. don't impact in dominant the automobile.

## III. RELATED WORK

Various researches are created by totally different researchers in developing this project. However, they serve {a totally different|a special|a unique|a distinct} application and have different technologies enforced. a number of those papers square measure mentioned below stating their technology and application.

D.Saravanan, R.Parthiban, G.I.Archanaa [1] have printed a paper supported a project that|during which|within which} the good agriculture supported observation through automaton watch which is wore by farmer so the person will monitor the crops and farm land through watch. It includes observation of wetness of crops defects of crop, temperature of crops, correct irrigation and environmental factors ceaselessly.Various nodes square measure mounted on totally different areas within the land. dominant these sensors through mechanism with interfacing through automaton watch, Wi-Fi, arduino board.

Mr. Vedant Chikhale, Mr. Raviraj Gharat, Ms. Shamika Gogate, Mr. Roshan Amireddy [2] have made-up a decide and drop mechanism. They wished it to be used for disseminative a bomb remotely with safety. For the robotic arm, they used a combine of motors and another combine because the wheels of the mechanism for dominant the movement. property is established victimization Bluetooth. The micro-controller used is LPC2148. that they had additionally connected a wireless camera for remote police

work. they need worked on this project primarily for industrial and military applications.

Ayan Maity, Avijit Paul, Priyanka Goswami, Ankan Bhattacharya [3] has developed automaton controlled robotic automobile. Main aim of his project was the transfer of knowledge wirelessly between a smartphone and also the mechanism and developing the mechanism and its communication system beneath an occasional value and open supply philosophy. He has used Arduino micro-controller and Bluetooth module during this mechanism.

Nelson Rai, Deepak Rasaily, Tashi Rapden Wangchuk, Manoj Gurung, Rit Kr. Khawas [4] This Work relies on Arduino, motor driver and Bluetooth module. Arduino is AN ASCII text file prototyping platform supported easy-to-use hardware and computer code. Arduino uses AN ATmega328 microcontroller. Since AI has become a serious half in our everyday life and additionally within the engineering field and it plays a significant role within the development of latest technology. This is a really straightforward and straightforward kind variety of remote automobile, wherever the normal micro-controller has been replaced by Arduino and IR sensors has been replaced by a Bluetooth module. The remote are often any automaton or IOS cell phones. This project are often created during a larger scale for real time vehicles.

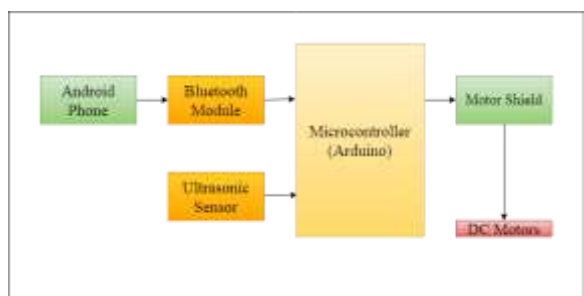
K. Kannan, Dr. J. Selvakumar [5] have organized AN mobile mechanism whose motions are often controlled by the user by giving specific voice commands. The speech is received by a mike and processed by the voice module. once a command for the mechanism is recognized, then voice module sends a command message to the robot's microcontroller.

Topic	Author	Year	Findings
Voice Controlled Robotic Car Using Arduino for Smart Agriculture	1. D.Saravanan An 2. R.Parthiban An 3. G.I.Archanaa Aa	2018	The required information that's collected supported the agriculture square measure absolutely good controlled system with the of golem sensing through voice controlled process by robotic automobile

Voice Controlled Robotic System using Arduino Microcontroller	1. Mr. Vedant Chikhale 2. Mr. Raviraj Gharat 3. Ms. Shamika Gogate 4. Mr. Roshan Amireddy	2017	Voice commands square measure transmitted and received through wireless serial communication with the assistance of Bluetooth technology.
Android Application Based Bluetooth Controlled Robotic Car	1. Ayan Maity 2. Avijit Paul 3. Priyanka Goswami 4. Ankan Bhattacharya	2017	Android good phone is employed as a foreign management for in operation the automaton.
Bluetooth Remote Controlled Car using Arduino	1. Nelson Rai 2. Deepak Rasaily 3. Tashi Rapden Wangchuk 4. Manoj Gurung 5. Rit Kr. Khawas	2016	The Bluetooth module is dominant the automobile is compete by the Arduino Uno
Arduino Based Voice Controlled Robot	1. K. Kannan 2. Dr. J. Selvakumar	2015	Robot whose motions are often controlled by the user by giving specific voice

**IV. PROPOSED SYSTEM**

The projected golem is that the central process unit are a microcontroller connected with associate degree humanoid operated sensible phone via a Bluetooth module. It be accustomed express command mistreatment associate degree app and can convert the voice command into text moreover as send the info to the microcontroller mistreatment Bluetooth.



Motor driver are needed for dominant the movement of the golem and it'll be operated by the microcontroller to regulate 2 totally different motor of left and right by dominant the direction of rotation of motors. associate degree unhearable detector are interfaced to find obstacle and facilitate golem to control full mechanically.

The projected system style attribute-based totally different operate like obstacle detection, voice recognition. This all task area unit complete by mistreatment the various package and hardware parts.

**The system contains 2 modules**

- Obstacle detection
- Voice recognition
- **Obstacle detection:-**

This planned system ar used for the 2 form of detectors initial is inaudible detector used for the obstacle detection another one is IR sensor used for motion detection, human detection.

- **Voice recognition:-**

Voice recognition is that the method of taking the vocable as associate degree input to a trojan horse. this is often vital to video game as a result of it provides a reasonably natural and intuitive manner of dominant the simulation whereas permitting the user's hands to stay free.

**Actual working:-**

- **Transmitter Section:-**

On the transmitter section, voice commands ar given to golem application. The golem application can take the voice commands convert it into digital values by victimization intrinsical analog to digital convertor (ADC) and compare it with the predefined voice commands (for eg: forward, backward, left, right) and transmits those values consistent with the voice commands within the style of binary. This binary info is then received by the Microcontroller (ATmega) and enters into the switch case. it'll compare the worth with the cases and consistent with it the string with the command is transmitted via Bluetooth.

- **Receiver Section:-**

On the receiver section, the digital signals ar received by the Bluetooth module, and it sends the binary values to the microcontroller (ATmega). The small controller enters into the switch case and compares those string values with the values in switch case. Then consistent with the string worth it'll drive the servo motors in a very continuous loop.

**V. WORKING MODEL**

**• Block Diagram:-**

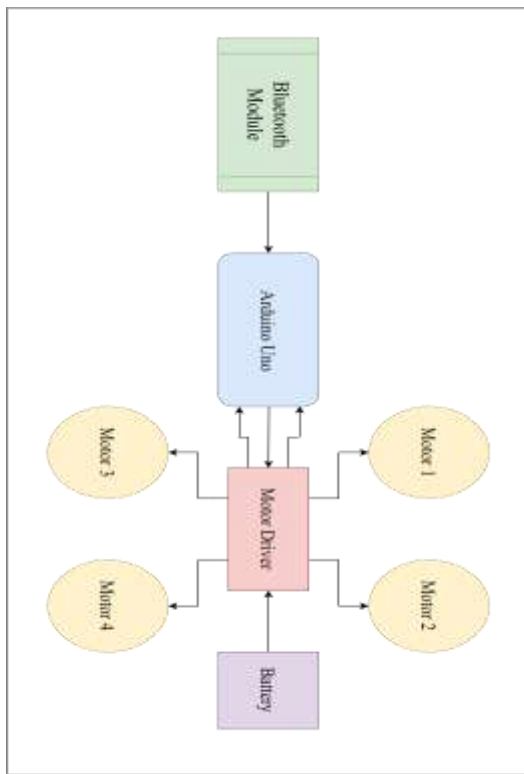


Figure:- Block Diagram

**• Flow Chart:-**

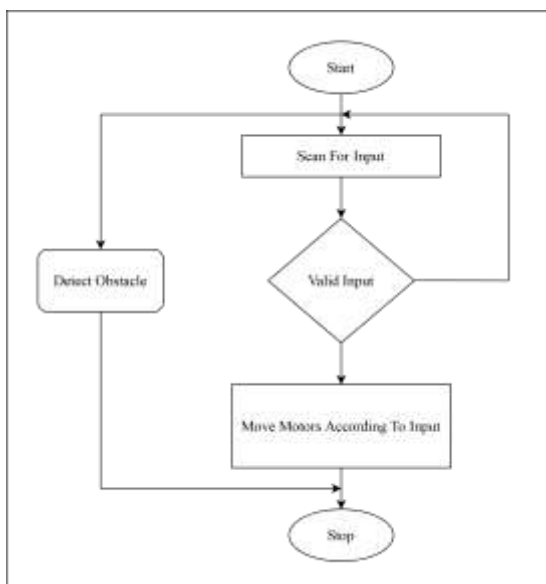


Figure:-Flow Chart

**• Working:-**

- The automotive runs on straightforward voice commands forward , back ,left ,right , stop.
- The voice command is given to the golem application as input.
- This input is given to Arduino by Bluetooth module and Arduino provides commands to the motors as programmed.
- With facilitate of servo and inaudible detector it will sense the obstacles

**VI. RESULT**

**• Training of Voice Module:-**

For the first-time use, we want to try and do some configuration:-

1. Choose the serial baud (default 9600).
2. Choose the communication mode:-Common Mode or Compact Mode.
3. Recording 5 directions of the cluster.
4. Import the cluster you wish to use (only acknowledge directions at intervals cluster at constant time)

After all the setting higher than, you'll be able to speak or send voice instruction thereto. If known with success, result are came back via port within the format: cluster range + command range. as an example, come Result: eleven (Compact mode returns 0x11) means that known the primary command of cluster one.

If voice instruction is recorded, on every occasion when you power it on, you wish to import the cluster before rental it establish voice directions.

**• Recording Stage:-**

1. Record indication: D1 (RED) flashes three times at intervals the 600ms, then off for400ms, then flashes quickly for four times at intervals 600ms. currently the recording indication is over.
2. Begin to speak: D1 (RED) is off for 400ms, then is on. Voice throughout the time whereas D1 (RED) is on are recorded by this module.
3. Recording a voice instruction with success for the primary time: D1 (RED) off, D2 (ORANGE) on for 300ms.

4. Recording a voice instruction with success for the primary time: D1 (RED) off, D2 (ORANGE) on for 700ms.
5. Recording failure: D2 (ORANGE) flashes four times at intervals the 600ms. In cases that voice directions detected doubly don't match, or the sound is simply too giant, or there's no sound, recording can fail. you wish to begin over the recording method for that instruction.

- **Waiting Mode:**

In waiting mode, D2 (ORANGE) is off, and D1 (RED) is on for 80ms each alternative 200ms, quick flashing. during this mode, it doesn't acknowledge voice command, solely anticipating serial commands.

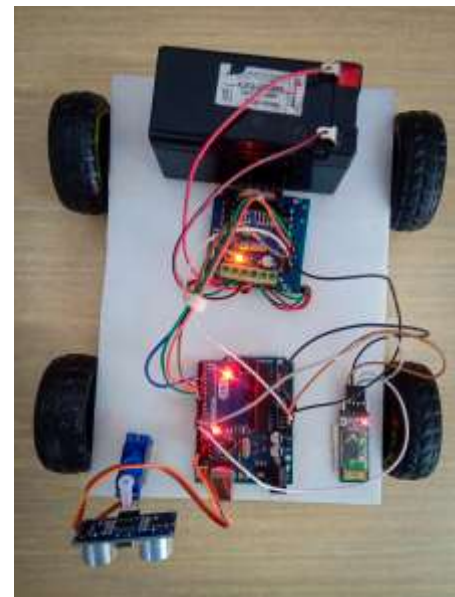
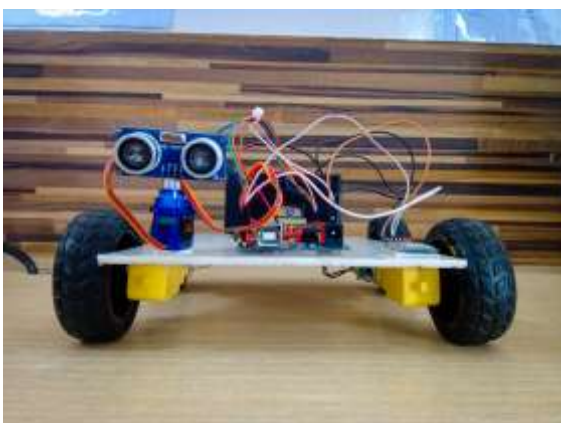
- **Recognition Stage:-**

In identification stage, D2 (ORANGE) is off, and D1 (RED) is on for 100ms each alternative 1500ms, slow flashing. during this stage, this module is process received voice signal, and if matching, it'll send the result at once via port.

- **Recording:-**

Before exploitation it, we've train it by recording voice directions. every voice instruction has the utmost length of 1300ms, that ensures that almost all words are often recorded. Once you begin recording, you can't stop the recording method till you end all the five voice directions recording of 1 cluster. Also, once you begin recording, the previous voice directions in this cluster are erased.

- **HARDWARE IMPLEMENTATION:-**



## VII. CONCLUSTIONS

- The voice recognition software package has associate degree accuracy around seventy fifth in properly distinctive a voice command.
- But it's sensitive to the encircling noises. there's an opportunity of misinterpreting some noises united of the voice commands given to the automaton.
- Also the accuracy of word recognition reduces in face of the noise. The sound returning from motors contains a important impact on accuracy.
- There area unit some drawbacks within the mobile platform.
- In these model we will add immoderate sonic detector for stopping the vehicle if any obstacle comes

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