

# Voice Operated Robot Using Raspberry Pi

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**Abstract** - A robot is usually an electro-mechanical machine that is guided by computer and electronic programming. Many robots have been built for manufacturing purpose and can be found in factories around the world. Designing of the latest inverted ROBOT which can be controlling using an APP for android mobile. The system operates with the use of an android device which transmits voice commands to raspberry pi to achieve this functionality. The transmitter consists of the android phone Bluetooth device. The voice commands recognized by the module are transmitted through the Bluetooth transmitter. These commands are detected by the robotic vehicle in order to move it in left, right, backwards and front directions. The Bluetooth receiver mounted on raspberry pi is used to recognize the transmitted commands and decode them. The controller then drives the vehicle motors to move it accordingly. This is done with the use of a driver IC used to control the motor movements. The Bluetooth technology used to transmit and receive data allows for remotely operating the system within a good range.

**Key Words:** Android Smartphone, Bluetooth module, robot, Raspberry Pi Kit.

## I. INTRODUCTION

It has always been a dream of human being to create machines that behave like humans. Recognizing the speech and responding accordingly is an important part of this dream. With the improvements of the technology and researches on artificial intelligent, this dream comes true relatively. It is aimed to make a contribution to this dream. Controlling the machines and environment with speech makes human life easier and more comfortable. This project is a simple implementation of this approach. A robot is controlled by voice commands. Voice command is taken through a microphone, processed in computer and sent to the robot and finally the robot acts accordingly. Speech is the most used way of communication for people. We born with the skills of speaking learn it easily during our early childhood and mostly communicate with each other with speech throughout our lives. By the developments of communication technologies in the last era, speech starts to be an important interface for many systems. Instead of using complex different interfaces, speech is easier to communicate with computers.

In this paper, it is aimed to control a robot with speech commands. The robot is able to recognize spoken commands to move correctly. To give a direction to robot, first the voice command is send to the ANDROID phone. The android recognizes the command by speech recognition system. And then android converts the voice command to direction command that predefined and

recognizable by robot. When the robot gets the direction command, it moves according to spoken command. shows its advantage by integrating with smart phones. The people use digital technology at home or office, and has transfer traditional wired digital devices into wireless devices. A host Bluetooth device is capable of communicating with up to 7 Bluetooth modules at same time through one link[2]. Thanks for Bluetooth technology and other similar techniques, with dramatic increase in smart phones users, smart phones have gradually turned into an all purpose portable device and provided people for their daily use [3][4]. In recent years an open source platform Android has been widely used in smart phones[5]. Android has complete software package consisting of an operating system, middleware layer and core applications. Different from other existing platforms like IOS, it comes with software kits.

## II. METHODS

As it is mentioned that to control a Robot through mobile phone it is obvious that we have to make android application, now it is to be studied that the function of android application.

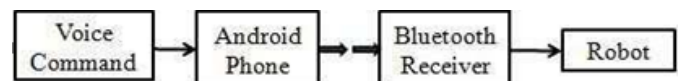


Fig.1 Block diagram of voice operated robot

### 2.1 Voice Command:

with the help of voice command we give the input to robot.

### 2.2 Android phone:

In the model, an android application for voice recognition is developed. This application converts the voice command to text and sends it to the robot.

### 2.3 Bluetooth Receiver:

This application converts the voice command to text and sends it to the robot via Bluetooth.

### 2.4 Robot:

The robot receives the voice and compares it with the programmed commands in the microcontroller and executes the directed action. This process is shown in the block diagram

We use android application for voice recognition, once voice is recognized the user can be able to control the robot as per desired command. The voice command is going to be converted into text it is described in block diagram below.

Operating System have developed a lot in last 15 years .Starting from black and white phones to recent smart phones or mini computers ,mobile O.S. has come far away .Especially for smart phones ,Mobile O.S.has greatly evolved from palm O.S. in 1996 to Windows pocket PC in 2000 then to Blackberry OS and Android.

### III. LITERATURE REVIEW

Prof. Subhash. P. Rasal [1] suggested robotic vehicle system for disabled people (controlled either by oral commands or by human computer interface (HCI)) is proposed as a project based on Microcontroller. A disabled person sitting in a vehicle can control it by giving oral commands. If the person is further unable to control, it can directly be controlled from the base station using oral commands or by using GUI. Voice Controlled Robotic Vehicle(VCRV) is to listen and act on the commands received from the user.

Abhinay Alishety, Harsha Chapala, Dr. M. Narayana [2] presented paper is to realize the smart living, more specifically the home lighting control system using Bluetooth Technology. Robot and smart phones are a perfect match, specially mobile robots. This system would find wide variety of applications. It is indeed possible for a user to learn to effectively manipulate real world objects with only verbal voice as a control mechanism. The proposed results provide strong evidence that the further development of voice controlled robotics will be successful

V.Nagamani, Shanti Swaroop Kampa, Ch.Sreedhar, A.Rakesh Reddy [3] suggested Speech Recognition System possesses a higher recognition rate in low noise environment. The speech recognition circuit has accuracy around 75% in correctly identifying a voice command. But it is highly sensitive to the surrounding noises. There is a possibility of misinterpreting some noises as one of the voice commands given to the robot. Also the accuracy of word recognition reduces in face of the noise. The sound coming from motors has a significant effect on accuracy.

Ranjeeta Chauhan, Anup Kumar [4] presented voice-controlled smart car designed can be regarded as a model of Auto control. It could be widely used in various automated control systems if continuing to improve its function. When making some minor changes, it could be used to control air-conditioner, video recorders and other electrical appliances Fig.20 is the picture of acoustic controlled robotic car.

K.Kannan, Dr.J.Selvakumar [5] suggested Human-Robot interaction is an important, attractive and challenging area in HRI. The Service Robot popularity gives the researcher more interest to work with user interface for robots to make it more user friendly to the social context. Speech Recognition (SR) technology gives the researcher the opportunity to add Natural language (NL) communication with robot in natural and even way. Also the appearance of

the SR interface in the standard software application as a Natural Language (NL) user interface in HCI field for the novices encourages Robotics to use SR technology for the HR. The working domain of the Service Robot is in the society -to help the people in every day's life and so it should be controlled by the human

Ritika Pahuja, Narender Kumar [6] presented paper work titled "Voice Activated Robot" has been developed from the basic idea of designing a completely automated system possessing reprogram ability feature, to meet the industrial and real time applications, and can work in any situations, with maximum efficiency and more life time. As discussed earlier the robot emulates biomorphic properties to a certain extent. The basic working principles of communications for sensor properties and stepper motor are thoroughly studied prior to their application in the paper work.

Garima Pandey, Diksha Dani [7] presented paper Android is now the most used mobile operating system in the world. Android now has more users, more phones and more tablets worldwide than any other mobile operating system. The Google Play app store has been growing at breakneck speed and with almost as many apps as the Apple app store. This, for entrepreneurs and developers, is the chance of a lifetime to make even more money and reach an even broader audience base.

Jonathan Gatti, Carlo Fonda [8] suggested A man-machine interaction system is described which aims to establish an automated voice to sign language translator for communication with the deaf using integrated open technologies. The first prototype consists of a robotic hand designed with open scad and manufactured with a low cost.

### IV. APPLICATION

The proposed results provide strong evidence that the further development of voice controlled robotics will be successful.This system would find wide variety of applications.Mainly systems such as household appliances like washingmachines microwave ovens etc. will become voice controlled in future. In such case this research will work out practically satisfying the need of the day efficiently.

### V. CONCLUSIONS

The objective of the paper is to realize the smart living,more specifically the home lighting control system usingBluetooth Technology. Robot and smart phones are aperfect match, specially mobile robots. As phones andmobile devices are each time more powerful, using the mas robot for building robot with advanced feature such asvoice recognition. Android Bluetooth-enable phones andBluetooth module via HC-06 and communication amongBluetooth devices. It is concluded that smart living willgradually turn into reality that consumer can control theirhome remotely and wirelessly.

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## ACKNOWLEDGEMENT

I take this opportunity to express deep sense of gratitude and sincere thanks for valuable assistance that I have received from my guide Prof. Altaaf O. Mulani, I also express thanks to all who guided me, supported me during this work.

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