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Voice Command and Bluetooth Controlled Robot

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Abstract - *The purpose of robotics in commercial and residential intention has to be quite essential for executing challenging work to make simple and easy. Robotics is field where still it requires lots of research and development. This paper represents research on designing and implementation of a voice-controlled robot using mobile phone and Arduino Uno microcontroller. The whole robot can be controlled by voice input. HC-05 is helping to establish a communication between Arduino and android phone. The voice command is converted into a text by the app of the smart phone and sends a valuable data to the microcontroller for controlling a robot.*

Key Words: **Robotics, Operations and Controlling movements, Functional model, Microcontroller UNO, Communication flow.**

1. INTRODUCTION

The robot has been built with the intention to perform different-different task which can adopt the further modification.

Analysis on numerous techniques of controlling robot has accomplished quite a few successes by introducing a number of innovative and unique methods of robot movement control. Controlling robot with bluetooth and IoT is always an impressive task. Robots are supposed to Socializing along with the end users. If you analyze then you would find that techniques to control robot using voice identification, yet it is reasonably limited. I have demonstrated a development of a voice-controlled robot it has a potential to follow the users command. As we all know earlier robot development environment were using Zigbee which is costly device. What I have done exactly? I have used smart phone / android phone and HC-05 which is on the robot and robot is based on the Arduino Uno. What it does? It takes a verbal input from the end user then perform the execution of the instruction accordingly.

The robot will be consisting of a microcontroller Arduino because as we all know Arduino has ability to Perform multiple task which shows its versatility or versatile nature of it. The robot will utilize Bluetooth technology and standard communication interface known as SPI interface.

Bluetooth uses radio waves with, safe and less power consuming device. Without using any kind of physical contact like wires and cable.

2. OPERATIONS OR CONTROLLING MOVEMENTS

I have already defined that this is a voice-controlled robot which can be controlled by using voice commands. Whatever the command end user will give it will recognize that particular command and perform respective operation.

End user will give their voice input using their individual smart / android phones. In this your voice input will converted into text then text transmit to the microcontroller via HC-05 Bluetooth module.

When microcontroller receives a command then it executes the command and instruct motor driver to respond accordingly. The robot can move forward, backward, right, left. We have used dc motors which gives power to the robot to move from one place to another place. This robot contains 4 dc motors and 4 wheels and one motor shield driver L293D which plays an importantrole to run the dc motors.

You can stop this robot using simple voice input “stop”.

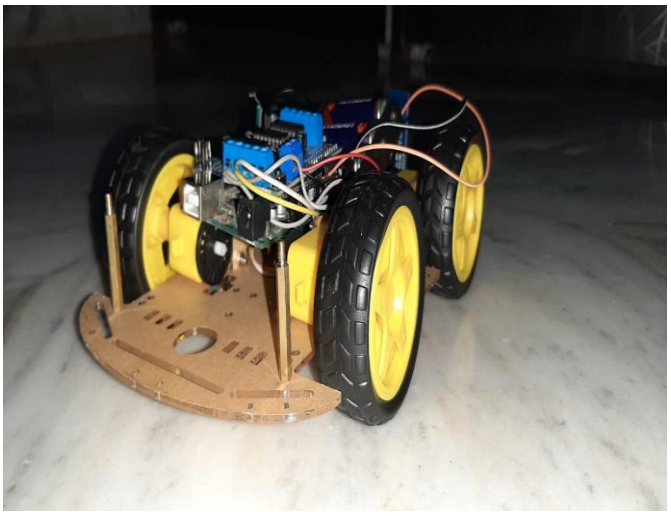

Fig -1: Assembling parts.

3. FUNCTIONING MODEL

In this I have discussed about the functionality of this catchy robot. Functionality of a robot is always a very interesting likely we always offer an interest in the functionality of the robot and the robotics as well.

The part which plays an important role in the functionality of this robot is-

A. HC-05

B. Android phone

C. Arduino microcontroller

D. Motor shield

E. Dc motor

How communication flows-

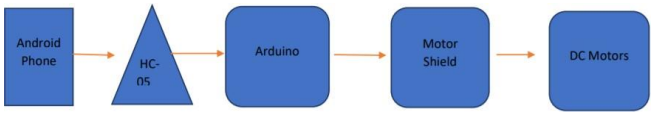

Figure 1. Communication flow diagram

User gives an input using android smart phone then that particular voice command will be converted into a text input then it will transmit to the microcontroller. And microcontroller will read that input and start sending the signal or instruction to the motor shield and then motor will supply adequate power to the dc motor to respond accordingly to the particular voice command. Then dc motor will start moving and wheels also.

3.1 Circuit connection

Central processing will be an Arduino consisting of 14 digital and 6 analog pins. The development of the power supply will be implemented using 1M7805 and LE33 which has three terminals of input, ground and output and able to provide fixed voltage with accuracy to maintain the voltage regulation.

Capacitors of different values will be used to construct circuit for filtering and bypass purpose Bluetooth module will be interfaced with microcontroller using two data pins known as RX and TX.

Motor driver L293D has 16 pins where 4 pins are used to connect two DC motor and another 4 pins are connected to the microcontroller for controlling the dc motors.

4. RESULT AND ANALYSIS OF DEVELOPED ROBOT

When we are providing voice command using Android smart phone what happing here is that application is converting / changing your voice input into textual/ text input.

Textual content will be transmitted to the Arduino using HC-05 module through mobile phones which usually holds microphones to process the signal and ultimately robot will start responding according to the end users command

The robot is able to move forward and backward and performing Radial turns. According to the input given from Arduino, which gives input according to command received from the user.

I gave command turn right then it turned right.

5. Conclusion

We are living in the era where we all are focusing our respective task. How we all can ease our task? No one wants to put efforts like physical effort and this lazy nature of us bending towards an innovation or another way we can call it the development of robotics.

Robotics is the key which we have at this scenario to perform different tedious task. As we all know this era is adopting new technique /technologies which makes them smarter and more powerful. In this I have developed a robot which can be controlled by human voice and it is very cost effective. Whatever the command end user will give it will execute all those.

It has ability to move forward, backward, radial right turns, radial left turns, stop.

It has built with the intention of future updates. In future in case if you want to add some more attributes then you can easily add, without a second thought.

In future we can add some AI (Artificial Intelligence) features by which we can avoid android phone for the command transmission.

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