



SERIAL COMMUNICATION ROBOT

Subtitle : Voice Controlled Robot

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Abstract : Serial communication is designed in such a way that two devices communicate through one single bus, In case of communicating wirelessly we can use modules such Wi-Fi module, Bluetooth module etc.

Keywords – Robot, Arduino, Sensors

I. INTRODUCTION

While writing Serial Communication codes for applications in robotics, the idea is that the code will process the Bluetooth feed as input, and, based on the situation, will give instructions to the Arduino which is controlling the robot, so as to make it move in a particular direction or perform a particular action. All of this is implemented through the same Arduino IDE, whose final output is a simple movements or actions , which serves as the directions for the arduino.

II. HARDWARE REQUIREMENTS

The hardwares that are used in the development of this project are Arduino nano, Jumper wires,Servo Motors,Gear Motors,Battery,Motor board and Bluetooth Module

III. PROJECT CATEGORY

- **IOT :** The Internet of Things (IoT) specifies the network of physical objects that are embedded with sensors, software, and other technologies.The purpose is to connect and exchange data with other devices and systems over the internet. With more than 7 billion connected IoT devices today, experts are expecting this number to grow to 10 billion by 2020 and 22 billion by 2025.

IV. LANGUAGES AND SOFTWARE TOOL USED

- The language used in coding is C programming , The operating system is windows 11 and the tool used in inserting the code is Arduino IDE

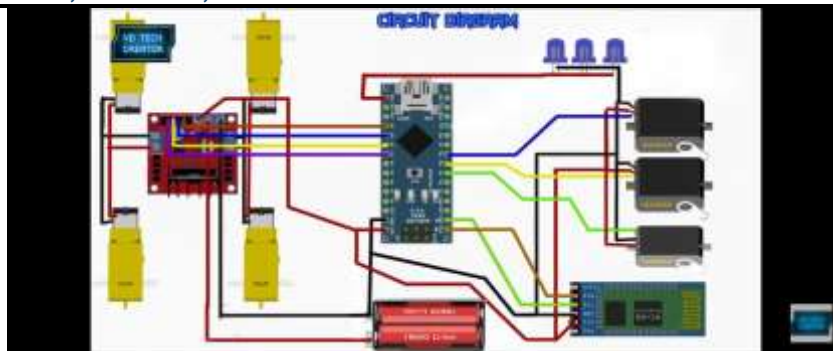


Fig no 1 : Circuit Diagram

V. CIRCUIT DESIGN OF SERIAL COMMUNICATION ROBOT

The circuit consists of Arduino Nano, which is the brain of the project, the use of Gear motor and Servo motors is used for the display of action or movement. The design of the circuit is a bit complex and is explained below of the available 14 I/O pins on Arduino, we use 10 pins in this project. 2 pins are used for Bluetooth module that is TX and RX, 2 pins are used by Servo motors that is D5 and D6, Another 2 pins are used by the battery that is GND and VCC and other 4 pins are used by Motor board to control the gear motors and servo motors. The main Objective of the robot is to function / move precisely based on the voice command which is received through Bluetooth module

The 4 pins of Motor board that is from INT1 to INT4 are connected to Analog Pins A0 to A3 of Arduino, With respect to Arduino, Pins A0 to A3 are output respectively.

The Servo motor has 3 pins the positive is connected to VCC and the negative is connected to GND. For the output the 3rd pin of servo motor is connected to D5 pin of arduino respectively. (As we have used 2 servo motor D6 pin of arduino will be used by the 2nd Servo motor).

The 2 pins of Arduino that is TX and RX are connected to the Bluetooth module's TX and RX, they are connected Vice versa that is the TX pin of arduino is connected to RX pin of Bluetooth and the RX pin of arduino is connected to TX pin of Bluetooth. The Bluetooth that we have used is HC-05.

The 2 pins of arduino that is GND and VCC are connected to the GND and VCC of battery and Bluetooth module.

The Bluetooth Module is the main component that receives commands in form of signals which is sent to arduino to perform action based on the command.

VI. WORKING OF ROBOT

Bluetooth module is the main module that receives commands in form of signal from the user and transmit to the arduino nano then the action is performed by the robot.

The Commands are sent from the app known as BT Voice control for arduino shown in the figure below.

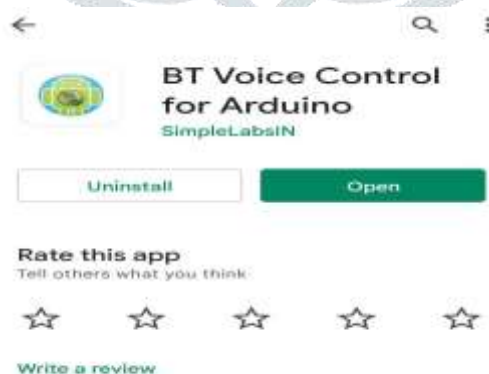


Fig no 2 : Android application

The commands are set of code written in C language, Command like "Go forward, GO back, Hands up and Hands Down" are used in this project.

Firstly you should download the app from the play store and then Connect the robot through the Bluetooth as shown in the figure below



Fig no : 3

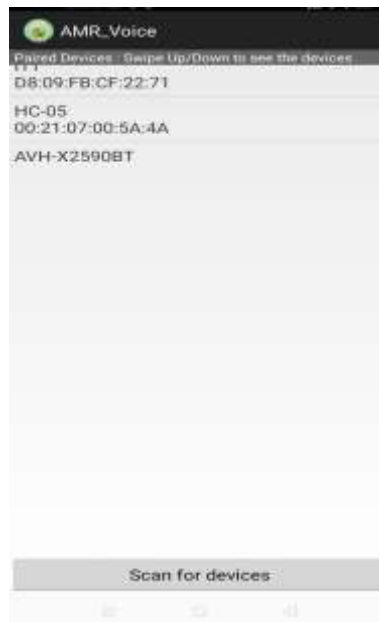


Fig no : 4

Then you should click on the microphone icon then say the command as shown in the figure below.

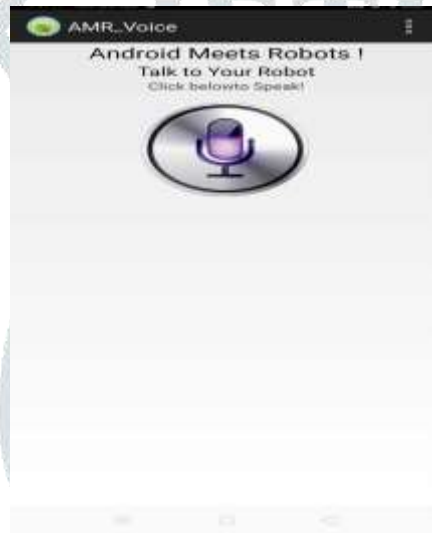


Fig no : 5

Once the command is passed successfully then the code is executed and action is performed by the Robot.



Fig no 6 : ROBOT



Fig no 6 : ROBOT

VII. CONCLUSION

The main Objective of the robot is to function / move precisely based on the voice command which is received through Bluetooth module, those voice commands are converted into text and verified by Arduino Nano and then Executed by the robot. The Robot is serial communiated.

VIII. ACKNOWLEDGMENT

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