

BLUETOOTH, VOICE CONTROLLED & OBSTACLE AVOIDING ROBOT USING ARDUINO CONTROLLER

Ravan Rathore, Dr. Rajesh Singh
MCA final year, AP Dept. of CSE
BSA College of Engineering & Technology, Mathura (UP)
Email: ravanrathore123@gmail.com

I. ABSTRACT

A robotic assistant reduces the manual work being put by humans in their day-to-day tasks. In this paper, we develop a Bluetooth voice-controlled robot and obstacle avoiding also. The human voice commands are taken by the Android phone connected with Bluetooth module attached robot. This robot can perform different movements such as right turn, left turn, stop, forward and can also develop a conversation with human voice. The voice commands are processing in real-time and using an offline server.

Keywords— Voice command, Robot , Arduino

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III. INTRODUCTION

The surprising raise in the utilizing of robots and automation offers various advantages as well as it has drawn the attention of both academic investigation and commercial programs [1]. The analysis on numerous technique of controlling robot has accomplished quite a few success by introducing a number of innovative & unique methods of robot movement control. Verbal interaction intended for robot controlling is actually sort of an innovative process among many methods which are introduced regarding robotics control [1]. Previous works on voice controlled robots [1]-[3] shows that the design of those robot were complicated and none of them were able to interact with users. Robots are anticipated to socialize along with its user however it has not yet arrived at this kind of level [2], [3].

There are numbers of techniques to control robot using voice identification yet it is reasonably limited [1]. The

development of a voice controlled robot is demonstrated in this paper which has the ability to follow voice command from user and does communicate with user by using pre-recorded human voice sound. The development of a voice controlled robot is demonstrated in this paper which has the ability to follow voice command from user and does communicate with user by using pre-recorded human voice sound. Another Voice Controlled Robotic Vehicle utilized computer with a sound card and a microphone which was not user friendly.

IV. PROPOSED ROBOT MODEL

A. Functional diagram

The functional diagram of the proposed robot is shown in figure. The central processing unit will be a microcontroller connected with an android operated smart phone via a Bluetooth module. It will be used to give voice command using an app and will convert the voice command into text as well as send the data to the microcontroller using Bluetooth. Motor driver will be required for controlling the movement of the robot and it will be operated by the microcontroller to control two different motor of left and right by controlling the direction of rotation of motors. An ultrasonic sensor will be interfaced to detect obstacle and help robot to operate full automatically.

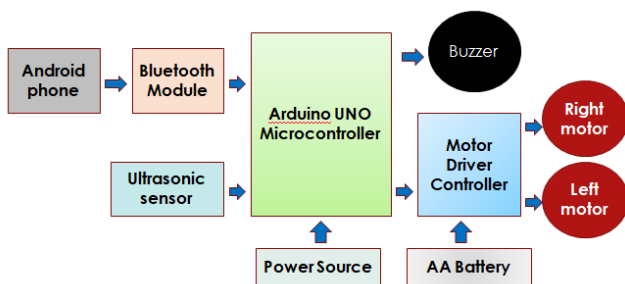


Figure 1: Block Diagram of Bluetooth control Robot

B. CIRCUIT DIAGRAM

Circuit diagram of the proposed robot is shown in figure 2. The main central processing will be an Arduino Uno consisting of 14 digital and 6 analog pins. The development of the power supply will be implemented using LM7805 & LE33 which has three terminals of input, ground and output and able to provide fixed voltage with accuracy to maintain the voltage regulation.

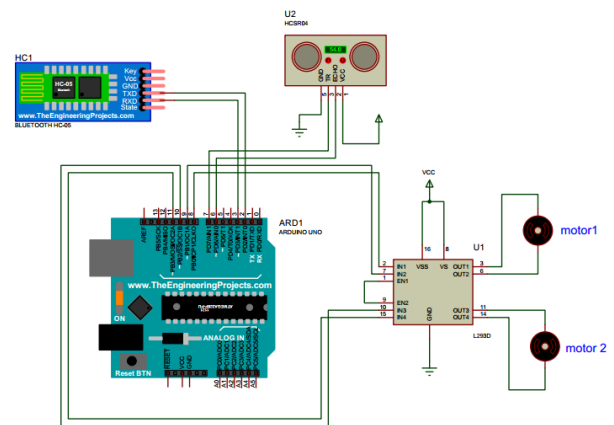


Figure 2: Circuit Diagram of Bluetooth control Robot

V. RESULT ANALYSIS OF DEVELOPED ROBOT

A. Speech Reorganization Process & Movement of the Robot according to the Voice Command

By using the android app the textual content was transmitted to the Arduino using Bluetooth through mobile phone handsets which had built-in microphones to process the signal and the robot made movement according to voice command [2]. Table 1 shows the instructions utilized for the movement of the robot. The robot was able to move forward, backward, left and right according to the input given to L293D from Arduino Uno which gave input according to the command received from user.

B. Interaction with User by generating human voice recording

Speaking ability of the robot was developed using several prerecorded sound of human voice for different interactions and stored in app which were played through the android phone when any specific voice command was given.

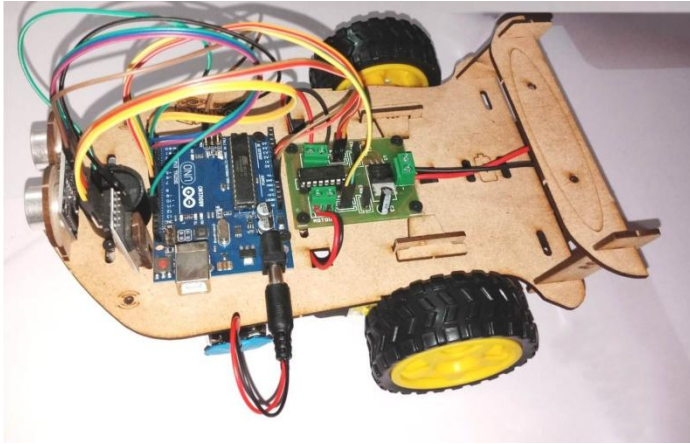


Figure 3: Bluetooth voice control robot + obstacle avoiding

Table 1: is showing different input for different logic

Voice Command	Input 1	Input 2	Input 3	Input 4	Direction
Stop	0	0	0	0	Stop
Forward	1	0	1	0	Forward
Backward	0	1	0	1	Backward
Left	0	1	0	0	Left
Right	0	0	0	1	Right

Table 2: is showing different recorded sounds of voice recording of the robot for different voice command.

Voice Command	Robot Interaction
Stop	The robot has stopped moving
Forward	The robot is moving forward
Backward	The robot is moving backward
Left	The robot is moving left
Right	The robot is moving right

VI. FUTURE SCOPE

1. This task work has been limited to short range Bluetooth module. Utilizing long range modules and other availability gadgets will bring about network with the robot for significant distances.
2. Picture preparing can be executed in the robot to distinguish the shading and the items.
3. Programmed Targeting System can be executed in the robot for following the objective.
4. The robot is valuable in places where people discover hard to reach however human voice comes to. For example, in fire circumstances, in profoundly poisonous zones.
5. The robot can be used for monitoring or investigation.
6. The robot can be used for monitoring or investigation.
7. Discourse and voice acknowledgment security frameworks.
8. It is the one of the significant phase of Humanoid robots.

VII. CONCLUSION

Voice control for a home assistant robot is developed in this paper. The voice commands are processed in real-time, using an offline server. The speech signal commands are directly communicated to the server over a wired network. The personal assistant robot is developed on a microcontroller based platform and can be aware of its current location. Performance evaluation is carried out with encouraging results of the initial experiments. Possible improvements are also discussed towards potential applications in home, hospitals, car systems and industries. The effect of the distance between the mouth and microphone on the robot, the performance of the robot, effect of noise on the speech to text conversion are some of the areas that can be further explored. The accent of the speaker does not affect the operation of the robot as the voice commands are processed using a cloud server which functions irrespective of the accent of the speaker.

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