An Open Access Journal

Voice Controlled Robo Child

¹ Dr. S. A. Awachar, ² Maitreyee Joshi, ³ Muskan Jattawale, ⁴ Nayana Bhatkar, ⁵ Pallavi Bhagat

Department Of Computer Science and Engineering Sant Gadge Baba Amaravti University (SGBAU), Maharashtra, India

Abstract-This project is all about creating a voice-controlled robo child that can show simple emotions like crying, laughing, singing, and even dancing, just by listening to voice commands. At the heart of it is an Arduino Uno, which works together with a Bluetooth module (HC-05) to receive voice commands through a mobile app. To bring the robo's emotions to life, we used an ISD1820 voice recording module that plays recorded sounds like laughter, crying, or songs. This robot child shows how voice-controlled robots can become more emotionally engaging, and it opens the door to building even smarter, more human-like machines in the future.

Keywords- Voice-Controlled Robo, Arduino Uno, ISD1820, Bluetooth Module (HC-05), Motor Driver etc.

I.INTRODUCTION

The capacity of a machine to mimic human feelings and respond vocally creates new possibilities for our relationship with technology. This article presents a novel idea: a Voice-Controlled Robo Child that can execute expressive movements like crying, laughing, singing, and dancing upon voice commands. The setup is largely built around an Arduino Uno microcontroller, which serves as the brain of the robot, processing and carrying out commands. It has wireless communication with an Android smartphone using a Bluetooth module (HC-05) that can support a voice control app. This voice-controlled system greatly adds to the robot's interactivity and makes it even more engaging and friendly, especially for kids. To mimic emotions and body movements, the robot is also equipped with an ISD1820 voice record and play module for voice functions, LEDs for visual indication, and servo motors through an L298N motor driver for movement, e.g., dancing. A certain voice command is assigned to each emotion or action, and the system is programmed to respond suitably in real time. The main goal of this project is to explore how cheap and common hardware modules can be used to create an emotionexpressing child robot.

Miss Maitreyee Joshi, (Student COET Akola)

II.ACTUAL IMPLEMENTATION AND WORKING

Module1



Overview of Components

1. Arduino Uno (central unit) – This acts as the main controller that processes voice commands and sends activation signals to the ISD1820 modules.

2. HC-05 Bluetooth Module (mounted on the breadboard) – This module is responsible for receiving voice commands from an Android application via Bluetooth.

3. ISD1820 Voice Playback Modules (three units) – Each module is linked to a small speaker and is preloaded with unique sounds: Crying, Laughing, Singing.

4. Speakers (three in total) – These are connected to the ISD1820 modules to produce sound.

© 2025 Dr. S. A. Awachar. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly credited.

5. Jumper wires and breadboard.

III. OPERATIONAL PROCEDURE (STEP-BY-STEP)

1. Voice Command Input: A mobile application, such as the Arduino Bluetooth Control App, is employed to send commands like "cry", "laugh", or "sing". The application transmits the command to the HC-05 Bluetooth module.

2. Command Reception & Processing: The HC-05 module relays the received command to the Arduino Uno via the serial interface.

3. Activating the Corresponding ISD1820 Module:

The Arduino is programmed to recognize the voice command and activate the appropriate ISD1820 module.

For "cry" \rightarrow Cry module pin goes HIGH

For "laugh" → Laugh module pin goes HIGH

For "sing" \rightarrow Sing module pin goes HIGH

This is done using digitalWrite(pin, HIGH) for a short delay, then LOW again.

4. Audio Playback: Once activated, each ISD1820 plays its assigned audio clip through the connected speaker. Only one module is activated at a time to avoid audio overlap.

Module 2:



Components Overview

1.Arduino Uno – This is basically the brain of the robot. It interprets voice commands such as "dance" and makes the motors send commands to get the robot to move accordingly.

2.L298N Motor Driver Module – This driver module serves as a go-between for the Arduino and the motors. It directs the speed and direction of spinning of the motors, depending on what the Arduino instructs it to do.

3.**DC Gear Motors** – These little yellow motors are actually what propel the robot forward. They're probably used to mimic arm and head movements—particularly when the robot is dancing.

4.Jumper Wires and Breadboard – These are used to connect everything together. They make it possible for signals and power to travel between all the pieces easily.

OPERATIONAL PROCEDURE (STEP-BY-STEP)

1. Voice Command Activation: The process begins once the user initiates a voice command such as "dance" using an Android application. This command is wirelessly sent by Bluetooth to Arduino Uno.The Arduino receives and identifies the command, and as a result, it comes to life by invoking the motor control sequence.

2. Controlling the Motors: The Arduino sends signals to the motor driver on digital pins 5, 6, 7, and 8, which are connected to IN1 through IN4 on the L298N module. These signals indicate whether each motor should rotate forward or backward. To control the motors' speed or power, Enable pins (ENA on pin 9 and ENB on pin 10) are utilized. These can either be controlled through PWM (Pulse Width Modulation) or be left with a fixed configuration, depending on the requirements of the project.

3. Motor Use in the Robot: In this configuration, two motors are assigned to robot arm movement, while one motor is responsible for head movement. When paired with the emotional displays integrated into Module 1—such as crying, laughing, or singing—this dance function provides a more realistic, interactive feel to the robot child.

IV. CONCLUSION

This project exemplifies the collaboration of integrated systems, voice recognition, and robotics to develop an interactive and emotionally responsive companion that offers entertainment, supports learning, improves communication, and encourages emotional growth. By allowing the robot to react to voice commands through behaviors such as crying, laughing, singing, and dancing, we strive to provide children with a delightful and flexible avenue for selfexpression, exploration, and social interaction. This initiative tackles important issues related to accessibility, affordability, and customization, making it an ideal choice for educational and supportive uses. In summary, the Voice-Controlled Robo Child is not just a technological milestone; it represents a vision of how technology can aid children, bridge communication gaps, and contribute to a more inclusive future.

REFERENCES

- Bisma Naeem, W. K.-U.-H. (2023, November 14).*Voice controlled humanoid robot*. Retrieved from Springer Nature: https://link.springer.com/article/10.1007/s4315-023-00304-z
- K. Kannan, D. J. (2015, March 01). ARDUINO BASED VOICE CONTROLLED ROBOT. Retrieved from Irjet: https://d1wqtxts1xzle7.cloudfront.net/89612245/ Irjet-v2i109-libre.pdf?1660456814=&responsecontent-

disposition=inline%3B+filename%3DArduino_Ba sed_Voice_Controlled_Robot.pdf&Expires=17454 28332&Signature=EEeIPbyI~2X0eE5TOZWP2deC 0Fi~ok4fYLQcjuYvRWi9Q6whqyubE

 K.Maheswari, B. B. (2021 , June 06). Voice Controlled Robot Using Bluetooth Module . Retrieved from Irjet: https://d1wqtxts1xzle7.cloudfront.net/68808943/ IRJET_V8I6817libre.pdf?1629369141=&response-content-

disposition=inline%3B+filename%3DIRJET_Voice _Controlled_Robot_Using_Bluet.pdf&Expires=174 5429487&Signature=PLQNrfcrXBJ9YCzejR-17bhEq0S1Si1Ly44xq8u1BrJtjfY4

 Sagar Pinjarkar, S. K. (2017, April 04). Voice Controlled Robot Through Android Application .Retrieved from Irjet: https://d1wqtxts1xzle7.cloudfront.net/53577631/ IRJET-V4I4783-

libre.pdf?1497865178=&response-content-Sagar Pinjarkar, S. K. (2017 , April 04). Voice Controlled Robot Through Android Application .Retrieved from Irjet:

https://d1wqtxts1xzle7.cloudfront.net/53577631/ IRJET-V4I4783-

libre.pdf?1497865178=&response-content-

disposition=inline%3B+filename%3DVoice_Contr olled_Robot_Through_Android_A.pdf&Expires=1 745430177&Signature=NyQmiN1ZF7cop0AOi43buleeVVedQd5LAqX6qgO6sTLGrt

5. Waltenegus Dargie, C. P. (January 2011). Fundamentals of Wireless Sensor Networks: Theory and Practice. John Wiley & Sons.