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WIFI TALKING ROBOT

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ABSTRACT

Now, consider you have a robot that communicates over Wi-Fi with you and follows your instructions. This Wi-Fi Talking Robot is built in a way to create interaction with a human effortlessly. It has Wi-Fi, so you can access it and talk to it anywhere, in real time. It understands what you say, and acts accordingly. The robot can even look up online to learn more and improve itself. Whether for educational assistance, customer service, or smart home management, this robot can aid in product related information queries and fast-track daily connected home tasks. This represents a major step toward building robots that can integrate into our lives seamlessly.

INTRODUCTION

The WIFI talking robot is an advanced machine that can connect to the internet via a WIFI network. It is built with three primary components: a microcontroller, a WIFI module and a speech recognition and synthesis module. The design features a microphone, a speaker and a power source. The WIFI module enables the robot to access the internet wirelessly, while the speech recognition and synthesis module allows it to understand and produce human-like speech. The goal of this WIFI talking robot is to facilitate interaction with users through speech technology. This paper aims to give an overview of the WIFI talking robot, detailing its components and capabilities.

WIFI Talking Robots represent an exciting fusion of technology and communication. These cutting-edge devices utilize wireless internet connectivity to engage with users through voice commands and responses. They can handle a range of tasks, from answering questions to offering companionship. Key features and capabilities of WIFI Talking Robots typically include voice recognition, which allows them to understand and respond to spoken commands. Natural language processing enables them to interpret and comprehend human language. Their internet connectivity provides access to a wealth of information and data. Additionally, customizable responses allow them to tailor their replies to individual preferences.

SIGNIFICANCE

1. **Human-Robot Interaction (HRI):** The robot can communicate with people using voice or sound, which enhances the overall experience and makes it feel more natural and engaging.
2. **IoT and Remote Control:** With WIFI integration, the robot becomes part of the Internet of Things (IoT), allowing for remote monitoring, control, and even task automation.
3. **Accessibility and Usability:** Utilizing Bluetooth for local control and WIFI for remote access offers users flexibility and convenience.
4. **Robotic Movement and Automation:** The L298 motor driver enables the robot to move physically, allowing it to navigate and carry out tasks either autonomously or in response to user commands.
5. **Educational Value:** This setup can act as a valuable learning tool for those interested in robotics, embedded systems, wireless communication, and IoT technologies.

MECHANISM

To create a Wi-Fi talking robot using the NodeMCU ESP8266, HC-05 Bluetooth module, SPBT 039A Bluetooth music player, and L298N motor driver, the NodeMCU manages both the robot's movement and audio playback. It connects to Wi-Fi and sets up a web server for remote control, while the L298N motor driver operates the motors based on commands from the NodeMCU. The HC-05 Bluetooth module interacts with the SPBT 039A music player to initiate audio playback, such as voice commands or sound effects. This system enables remote control of movement through Wi-Fi and audio control via Bluetooth, with separate power sources for the motors and the NodeMCU to maintain stable performance.

EQUIPMENTS

BO Gear Motor with Wheels: DC gear motors (3-6V) with attached wheels for motion, typically consuming 100-500mA current.

Cardboard : it is a generic term for heavy paper based products
Jumper Wires: 22 AWG flexible wires used to connect components, typically 10-20 cm long.

3.7V 18650 Battery: Rechargeable lithium-ion battery (2200mAh-3500mAh) with 3.7V nominal voltage and 4.2V max.

4Ω 2W Mini-Speaker (1.5 inch): Small speaker with 4Ω impedance and 2W power handling, ideal for audio output.

Bluetooth Music Player SPBT-039A: Bluetooth 4.0 module for wireless audio streaming, powered by 3.3V to 5V.

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NodeMCU ESP8266: Wi-Fi microcontroller (80-160 MHz) with 50 KB RAM, 17 GPIO pins, and 3.3V logic.

L298 Motor Driver: Dual H-Bridge motor driver (4.5V-46V, 2A max) for controlling DC and stepper motors.

12V Battery: 12V power source, typically leadacid or Li-ion, for powering motors or electronic circuits.

FUTURE SCOPE

Home Automation: It can act as a voice controlled assistant, controlling smart devices and playing music.

Entertainment: It can stream music via Bluetooth and offer interactive audio experiences.

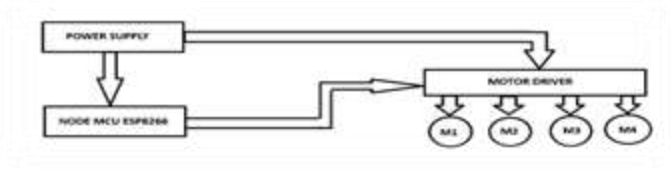
Robotics: It can be a mobile robot, performing tasks like surveillance or autonomous movement.

Healthcare: It can assist the elderly with reminders and remote health monitoring.

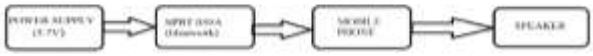
Education: It's an ideal tool for teaching robotics, IoT, and programming.

Security: Can be used for remote monitoring and alert systems.

PROPOSED SYSTEM



Block Diagram (A)



Block Diagram (B)

FUNCTIONALITY

Wi-Fi Operation: The Node MCU connects to a local Wi-Fi network and receives commands a web interface or mobile app, allowing users to control the robot from any device connected to the same network.

Bluetooth Operation: When Wi-Fi control is not available, the Bluetooth HC-05 module allows communication with the robot through a smartphone app, providing basic control commands for movement.

Talking Feature: A speech module (or software-based text-to-speech system) is integrated to make the robot speak predetermined phrases or provide real-time updates about its movements and status, adding an interactive and engaging experience

CONCLUSION

The talking robot, which can be controlled through WI-FI and Bluetooth, combines various wireless communication method with motor control, making it a flexible tool for both educational and practical uses.Creating a WIFI based talking robot marks a major step forward in education, communication and technology by interoperating voice recognition, natural language processing and WIFI connectivity, this robot can create interactive learning experiences, improve communication and serve a range of applications across different fields.

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