



VOICE ASSISTANT ROBOT FOR VEHICLE SYSTEM

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ABSTRACT :

Robotics is an interdisciplinary field that involves the design, construction, operation, and use of robots. Robotics integrates many fields that deal with specific aspects of robotics. For example, within mechanical engineering, the term robotics refers to the construction of the physical structures of a robot, while in computer science, robotics focuses on the study of robotic software. The existing voice-controlled robot uses a wide range of techniques for feature extraction. Any one of the techniques can be used to develop the system. The techniques are as follows: using 8951 microcontroller and rf modulator, voice-controlled robot using android mobile bluetooth, control robot by using mobile dtmf tone (touchpad) and atmega16 microcontroller, control robot using playstation controller. Description of the project: A person's voice command may be used to operate the robotic vehicle. These systems are commonly referred to as speech Automated control systems (SCAS). The concept is to build a vehicle that will be controlled by voice commands. A cell phone is used to operate the robot, there are several articles that demonstrate the contact between a robot and a smart phone. For remotely automating the robot, a smart phone is an excellent interface. It has a lot of functionality that can be useful. Components used in project are ESP8266 Microcontroller (Node MCU Module), 298 Motor Driver Module Power Distribution base Board, 12V Li-ion Battery, CSM-100 RPM-12V, Android Application. This project Voice Assistant Robotic Vehicle helps to control robot through voice commands received via android application.

Keywords: ESP8266 Microcontroller, L-298 motor Driver Module, Power distribution base board, 12V Li-ion Battery, CSM-100 RPM-12V, Android Application.

1. Introduction :

Speech signals are the most important means of communication in human beings. Almost every conversation to interact is done by means of voice signals. Sounds and various speech signals can be converted into electrical form using a microphone. Voice recognition is a technology which is used to convert the speech signals into a computer text format. This voice recognition technology can be used to control and generate speech acknowledgement using some external server. In current scenario vehicles are manually controlled and all are done by the person who is driving the vehicle. Every action like start and stop, applying brake, gear transmission, acceleration requires human effort. But nowadays new technologies have been developed that can be integrated with the conventional vehicles to new vehicle form. In the technology era, the space between the physical and the digital world is brought closer by the introduction of voice concept. For all dangerous tasks, we prefer technology rather than people. Even though these robots are being controlled manually in the early stages, these can now be controlled via voices. This technology of voice recognition can be defined by the interaction between the computer and voice of human beings. This constructs the communication link between technology and mankind. The target of this work is to upgrade the complete security to the robot and to simplify the controlling mechanism. The voice directions are handled, utilizing an advanced mobile phone. Voice Controlled Robotic Vehicle helps to control robot through voice commands received via android application. Normally these types of systems are called as Speech Controlled Automation System (SCAS). Our basic idea is to develop some sort of menu-driven control for our robot, where the menu is going to be voice-driven, but not aiming to build a robot which can recognize a lot of words. This paper describes voice activation speaker recognition and it is to develop a robotic vehicle using Arduino and to control the vehicle with the help of voice-based information. The whole mechanism of the project is based upon the device namely 2 Arduino. The main goal is to control the robotic vehicle in a desired position and also to control the robot by the voice.

1.1. Existing Model

As of my last knowledge update in January 2022, specific voice assistant systems for vehicles have become increasingly common, allowing drivers to control various aspects of their vehicles using voice commands. However, it's important to note that the automotive technology landscape evolves rapidly, and new developments may have occurred since then. Here are some examples of voice assistant systems for vehicles: Amazon Alexa Auto:

Amazon's Alexa has been integrated into various vehicles, allowing drivers to use voice commands to play music, get directions, control smart home devices, and access other Alexa skills. Some car manufacturers have included Alexa integration in their infotainment systems. Google Assistant in Android Auto: Google Assistant is integrated into Android Auto, Google's platform for in-car infotainment. It enables drivers to use voice commands to make calls, send messages, get directions, and control various entertainment features. CarPlay with Siri: Apple CarPlay integrates Siri, Apple's voice assistant, into the car's infotainment system. Siri allows users to control navigation, make calls, send messages, and interact with other apps compatible with CarPlay. Personal Assistant MW Intelligent: BMW has introduced its Intelligent Personal Assistant, which responds to voice commands to control in-car functions, provide information about the vehicle, and offer assistance with various tasks. Mercedes-Benz with "Hey Mercedes": Mercedes-Benz's MBUX (Mercedes-Benz MBUX enz User Experience) system includes a voice assistant activated with the phrase "Hey Mercedes." It allows drivers to control navigation, climate settings, and other vehicle features using natural language commands. Ford SYNC with Ford+Alexa: Some Ford vehicles are equipped with the SYNC infotainment system, which includes integration with Amazon Alexa. Drivers can use voice commands to control the vehicle and access Alexa's capabilities. Remember that developments in this field may have occurred since my last update, and it's advisable to check the latest information from car manufacturers and technology providers for the most up-to-date details on voice assistant integration in vehicles. Existing system is all about to analyse the human voice and act according to the programmed commands. The most basic commands are backward, forward, right, left and also to stop the robot. It cannot perform any tasks other than commands like backward, forward, right, left

1.2. Proposed Model

In this Project, we are proposing the robot that can perform different turns and movements with voice commands. With basic commands like backward, forward, right, left, and to stop the robot.

1.3. Introduction to Robotics

Robotics is the forefront of technology and its utilization is with the intentions to make our lives as humans as comfortable as ever. The more we allow robots to run menial and tedious work, we as humans can change our focus from things, we need to ensure our survival such as securing of food produce and water and the maintaining of our energy sources as well as machinery to a more intellectual base jobs where we use our knowledge to develop and build better and more efficient machines and robot which will further make our lives better. The goal isn't per-said to make the world a better place, but to make the world a better place stay and in the efforts of doing that we invertedly make the world itself a better place. Robotics is an engineer's way to do a complicated job or a repeated job after developing a system and a program to run it. There are many fields in robotics like control, AI, machine vision, modelling etc. Every field is inter-related to one another and it depends on your interest. Each field in robotics has a different purpose but if you combine them all you a final output. Control - This section of robotics is based on mechanical and electrical part of it. It has servo motors, sensors, actuators etc. It works on feedback of the system and mostly involves physical moment of the system. AI - This section is the brain of the system. It has all the coding and programming part of the robot. All the feedback and the equation are calculated here in this section. This involves all the mechanism behind the robot. Machine Vision - This is different than the other two above section. As the name suggest it is the technology on how things will change on continuous feedback of that is being provided to the AI using vision technology.

2. Experimentation :

This block diagram illustrates the overall control function of the system The Bluetooth wireless connection enabled in the system communicates with graphical user interface (GUI) on smart phone without cable. The communication between the robot and the android application is carried over by the Bluetooth link between the phone's Bluetooth and the Bluetooth device in the Robot. The voice commands are sent from the phone to the Robot which in turn checked by the ESP8266- micro controller for the control of the wheels according to the commands to move the robot in the desired direction also when the obstacle is detected by the Ultra Sensor placed in the front the robot avoids the path its moving and stops.

3. Result and Discussion :

The above refers to the final output of the robot. We can observe all the connections are made as per the circuit diagram. The Bluetooth module is used to send commands by which we can control the direction of robot. A 9V battery is connected as power supply. The two DC motors are controlled to their respective motor driver IC's and wheels are connected to them. Voice controlled robot moves according to the commands i.e., by saying Forward-it moves forward Backward-it moves backward Right - it moves right Left - it moves left And Stop

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