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Voice Control Car

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Abstract: In this report I will mention about my project. Robotic reduces the manual efforts being put by humans in their day-to-day tasks. My project is voice controlled car. The human voice commands are taken by the car through the Bluetooth device. In this project my aim is to control a car with my voice/speech. I am going to use a Android device to take my voice and simply process it with Voice recognizing software and send result values to the wireless controlled car that I made. I want to make a simple speech recognition program and a wireless device which took commands from android device and send those commands to the car. I need to understand how to code speech recognition program and sending this program result to a car wirelessly and real time.

Keywords: Bluetooth, Aurdino chip, servo motor, Ultrasonic sensor, Voice Recognition

I. INTRODUCTION

In proposed design, we wish to control the movements of the vehicle using voice commands from the user or the person who is controlling the vehicle. These commands will be issued at the Android Application on the user's phone which is connected to the car via Bluetooth Module. The goal or main aim of Voice Controlled Car is to listen and act on the commands which are received from the user. Here, the system will require the training from the user or the person who is controlling it (for the accent) after which the device will start understanding the commands issued. This is done by giving commands to the android device through a code.

Briefing:

The proposed topic involves voice recognizing. Voice recognition is the process of capturing spoken voice words and commands using a android or car and converting them into a digitally stored set of words. Two factors decide the accuracy of the proposed voice recognition system: Accuracy in detecting the human voice words and processing those words at the speed so that the commands are executed with the least delay. The surprising raise in the utilizing of car and automation offers various advantages as well as it has drawn the attention of both academic investigation and all programs. The analysis on numerous technique of controlling car has accomplished quite a few success by introducing a number of new & unique methods car movement control. interaction intended for voice car controlling is actually sort of an new process among many methods which are introduced regarding robotic car control. Previous works on voice controlled car shows that the design of those car were complicated and none of them were able to interact with users. There are numbers of techniques to control car using voice identification yet it is reasonably limited. The development of a voice controlled car which has the ability to follow voice command from user and does communicate with user by using pre-recorded human voice sound.

II. DESCRIPTION OF CAR

2.1 Transmitter:

Commands are given to the Mobile Application through which car is controlled through the micro-phone of the mobile handset. This mobile handset or the mobile application is connected to the moving car via Bluetooth module. The mobile application which is used, is programmed/coded in such a way that the voice commands given to the handset are received by the microphone and these analog voice commands are converted to digital word sequences. These stored sequences are than transmitted to the car via Bluetooth transceiver module.

2.2 Receiver

Transceiver is used to decode the received signal and for serial communication with the Bluetooth module. The controller compares these digital signals with the stored programme commands in it and convert them into voice strings. The voice strings are then used to run the servo motors for the desired interval of time.

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III. OVERVIEW OF PROPOSED SYSTEM

The robot will be based on micro controller Arduino Uno because of its versatile features along with numerous advantages which is based on Atmega328P and an open source platform with the benefit of physical computing. The system will utilize wireless bluetooth and Standard communication interface known as SPI interface. wireless bluetooth uses radio waves with safe, minimum power consuming device to connect and exchange data between devices without using of any kind of physical contact like wires and cable. SPI interface is a synchronous serial information process utilized by micro controllers for interacting along with one or more peripheral devices through limited ranges. There are two main applications that car will be able to perform which are discussed below.

3.1 Movement control of the robot using voice command:

The movement of the proposed car will be controlled by the voice command of the user. The user will use an android operated android device to give voice command. The command can be fetched using an application which will convert the voice command into text. The phone will be connected to the micro controller using a wireless bluetooth module. After conversation of the human voice command into text the app will send necessary data to the micro controller using bluetooth of the phone and micro controller will receive the data using bluetooth module. According to the command, the car will move forward, backward, left, right or fully autonomous. For driving the car there will be two geared DC motors with gripped tyre which will be operated by the help of DC motor driver. An ultrasonic sensor will be employed for obstacle detection during autonomous mode. Arduino Uno will send signals according to reading of the ultrasonic sensor to provide data about any obstacle in front of the car within a specific range. There will be a command for stopping the car at instant.

3.2 Communicate with the user by talking while performing each command:

To communicate with the user, the car will be able to talk while executing a specific command. After power up the car, it will greet the user and ask for command for performing its action. When user will command for any specific direction, the car will be saying by generating voice record that the car is moving for that direction and ask for next command. Until the car will receive the next direction, it will continue to follow the previous command. Each command car will receive, it will generate sound of every sentences defined for its each actions. As example, for backward command, the car will say "The car is moving backward". Similarly, car will speak with every instruction the user will give. The sound will be pre-recorded human voices and stored to a micro SD card connected to the micro controller unit using a SD card module.

IV. SYSTEM DESIGN

The design of the system is as simple as possible. Few things like cost-effectiveness and simplicity in design, low-profile structure etc. have been kept in mind before designing the project and our system aims to achieve the target to design a system that can provide following functionalities with a simple and easy-to-use interface:

a) Develop an android application that will act as an remote of a robot.
b) Develop a robot which will be helpful for travelling.
c) Here the focus is on the latest technology of android and robot also called as 'Mobot'.
d) An android smart-phone and the technology of android is vast and can be used to interact with embedded system.
e) Mobile, robot and Bluetooth are the on-going technologies which can be used for the benefit of mankind.
f) Hardware of this project consists of Arduino UNO, Bluetooth module and a motor driver IC.
g) The Bluetooth module is connected with the Arduino UNO board for the connection with the user.
h) Through the Bluetooth module for monitoring and controlling the particular motor reaches the board and process accordingly and the output of the Arduino goes to the motor driver IC and it controls the particular motor.

4.1. Arduino UNO:

Micro controller will act as the brain of the car. The car movement will be decided by the micro controller. In this system we will be using micro controller named Arduino UNO which contains ATMEGA 328P micro controller chip. The micro controller is programmed with the help of the Embedded C programming. Arduino has it own programming burn in its Read Only Memory (ROM). The ' C' program is very simple to implement for programming in the Arduino UNO.

4.2. Bluetooth Module (HC-05):

The Bluetooth module will act as an interface between android devices and microcontroller. We will be using HC-05 Bluetooth module for the system, which can be used as either receiver or transmitter. Generally our transmitter will be android device and receiver will be wireless Bluetooth module. wireless Bluetooth module will give the commands given by android devices to the microcontroller.

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4.3. Android device:

The android device is the transmitter of this circuit. It sends the data to microcontroller through Bluetooth module. It also helps to send the instruction of forward, backward, left, right to the microcontroller. Actually, the android device is used as a remote of this system. Here we the Bluetooth RC Controller application as the operating remote of this system.The advantage of this project is that the application software designed for android device is kept simple but attractive with all necessary built-in functions. we used AMR_voice control.

4.4Motor Driver (L293D):

Motor driver IC is used to control the dc motors. It is also interfaced with the micro controller.

V. WORKING PRINCIPAL

1. The voice command is provided to the android application as input.
2. This input is given to Arduino through Bluetooth module and Arduino gives commands to the motors as programmed.
3. Wireless communication between Bluetooth and robot car.
4. Receive and Control
5. The signal is given to the robat car and robot car is moved as per control signal.

Commands:

- Move forward
- Move backward
- Move left
- Move right
- Stop

VI. APPLICATION

The Robot car is useful in places where human find difficult to reach but humans voice reaches.
E.g. In a small pipeline, in a fire situation, In highly toxic area.
A robot car can be used as a toy.
It can be used to bring and place small object.

VII. SOFTWARE USED

Arduino ide software.

VIII. PROGRAMMING LANGUAGE USED

c++ language are used.

IX. CONCLUSION

Implementing a voice-controlled car system is a very interesting project because it allows us to explore our areas of interest and also create a system that is very useful and widely used. This allows us to combine a well-known software algorithm and implement it on hardware002E