Voice Controlled Robotic Vehicle Using 8051 Microcontrollers

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Abstract- The voice-controlled vehicle was created to make human work easier, since we live in an artificial intelligence-driven world where robots perform many tasks. The human voice is used to drive the vehicle. A stable android mobile application built with android studio software transmits the speech. It's essentially a Wi-Fi link. Using the mobile application, we can operate the vehicle with our voice from anywhere. The voice-controlled robot vehicle project has military, surveillance, and human applications in scope. It's a voice-activated wireless robot vehicle. The project's main goal is to guide the robotic vehicle to a specific location. In addition, the project's main goal is to use voice to control the robot. It is now possible to have human robot interaction. The aim of a voice controlled Robot is to listen to the user's commands and act on them.

Keywords- Microcontroller (8-Bit), Bluetooth HC-05, Voice Controlled Vehicle.

I. INTRODUCTION

Our proposed project aims at a robotic vehicle operated by human speech commands. The system operates with the use of an android device which transmits voice commands to an 8051 microcontroller to achieve this functionality.

The transmitter consists of the android phone Bluetooth device. The voice commands recognized by the module are transmitted by through the Bluetooth transmitter. These commands are detected by the robotic vehicle in order to move it in left, right, backwards and front directions.

The Bluetooth receiver mounted on top of the vehicle is used to recognize the transmitted commands and decode them. After decoding these commands are passed on to the 8051 microcontrollers.

The microcontroller then drives the vehicle motors to move it accordingly. This is done with the use of a driver IC used to control the motor movements. This project Voice Controlled Robotic Vehicle helps to control robot through voice commands received via android application using an 8051 Microcontroller.

II. VOICE CONTROL ROBOTIC CAR

1. Objectives:

The primary goal is to allow a voice controlled car to navigate to a specific location. Furthermore, ultimate aim is to monitor the robot via voice commands. It is now possible to have human-robot interaction. The aim of voice-activated technology is to allow people to control their environment through their voices the user's instructions must be listened to and followed by the robot.

The proposed system is made up of two parts: a transmitter and a receiver, all of which are powered by a microcontroller and a battery. We can monitor the robotic vehicle with the help of a Smartphone and a human voice. The project's aim is to use voice commands to operate a robotic vehicle.

III. PROPOSED SYSTEM

Robotics is abundant in today's world; they minimize human effort and assist us in completing tasks more quickly and intelligently. The **Bluetooth HC-05** is used in this project to build a voice-controlled robot vehicle. The android application is used to steer the car.

Recognizing a human voice emitted via a protected Android programmed, the vehicle may perform the functions. The car will drive forward, backward, left, and right and further stop. In addition, we look to add ultrasonic sensor when an obstacle or some other vehicle gets in the way.
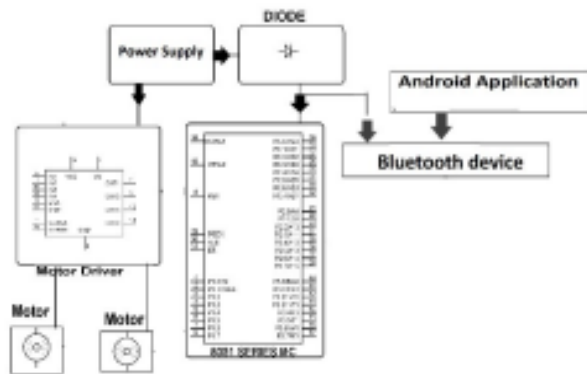

Fig 1. Working Diagram.

The main purpose of the research is to navigate a voice- controlled car to a particular route. Furthermore, the project's main aim is to monitor the robot using voice commands. It is now possible to have **human-robot interaction**. The aim of voice-activated technology is to allow people to control their environment through their voices the user's instructions must be listened to and followed by the robot.

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IV. METHODOLOGY

- Step 1: Voice commands are been considered to control the vehicle.
- Step 2: If the command is Forward then right and left wheel moves clockwise.
- Step 3: If the command is Left then right wheel moves clockwise.
- Step 4: If the command is Right then left wheel moves clockwise.
- Step 5: If the command is Backward then right and left wheel moves anti-clockwise. Step 6: If the command is Stop then right and left wheel stops moving immediately. Step 7: Ultrasonic sensors are

been considered to stop the vehicle when some object or vehicle interrupts between the range of lesser than 70 and greater than 40.

V. LITERATURE REVIEW

M Saravanan [1] developed "Arduino Based Voice Controlled Robot Vehicle" (October 2020) The main goal of this device is to create a robot vehicle that can be powered by a person's voice order. These systems are commonly referred to as Speech Controlled Automation Systems (SCAS).

The above mentioned device is a prototype of our design. The concept is to build a robot 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.

The specified task is carried out in this design using an android application and a microcontroller. Bluetooth technology facilitates communication between the software and the robot. The module will receive the commands that are sent over the channel. The aim of a voice-controlled robotic vehicle (VCRV) is for it to listen to and respond to the user's commands.

H. Jagadish Kumar [2] wrote "Voice Controlled Car using Arduino and Bluetooth Module" (December 2019). The objective of this report is to build a voice-activated car that reacts speech commands. Enhancements in the areas of disturbance and range handling are, nevertheless, needed.

Vipul Mehta [5] gave "Robot Controlled Car Using Wi-Fi Module" (May 2016) In this review, we'll glance at using a Wi- Fi module and an Android phone program to command a robot- controlled vehicle. We'll also demonstrate how to operate the appliances without an Android phone by sending a regular SMS. The aim of this paper is to show how to operate a robot- controlled vehicle using a Wi-Fi module and an Android Smart Phone application.

It also demonstrates that the devices can be operated by sending a regular SMS even if the user does not have an Android phone. This role can be easily modified to include a covert agent camera

that streams the recordings to the client through Wi-Fi. Instead of the usual lithium-ion battery, the venture would use sunlight-based batteries. Application will ask the user to activate Bluetooth. After Bluetooth is activated the application will check the existence of IBeacon. IBeacon functions as an identity for each classroom in the lecture building. 4].

(KaneezLaila Bhatti, Laraib Mughal, Faheem YarKhuhawar, Sheeraz Ahmed Memon, 2019) The main theme of this system based on face recognition to maintain the attendance record of students. The daily attendance of students is recorded subject wise which is stored already by the administrator. The system automatically starts taking snaps and then applies face detection and recognition technique to the given image and the recognize students are marked as present and their attendance update with corresponding time and subject id. This Method provides of Deep learning techniques. To develop this system, histogram of oriented gradient method is used to detect faces in images and deep learning method is used to compute.

Mrumal.K. Pathak [6] wrote "Robot Control Design Using Android Smartphone" (February 2015) The objective of this project is to build a robot which can be powered by an Android phone. An Android phone is used to command the robot using Bluetooth. In this design, the Android phone works as a remote control for the Robot. The overall system is connected to a microcontroller. Bluetooth module and DC motors are interfaced to the microcontroller. The Bluetooth module sends the information from the Android phone to the controller. The controller is in charge of the robot's DC motors. In order to execute the project, the controller is loaded with a programming language in the Embedded "C" language. The goal of this article is to develop exceptional functional android stages using less complex and confusing robot equipment.

V. CONCLUSION

The car is operated by voice in this project of voice control. A mobile robot that can be managed by voice commands is known as a robot vehicle. The speech recognition programme on an Android phone will recognize voice commands such as 'Forward,' 'Stop,' 'Left,' 'Right,' and 'Back,' among others. The operating principle of the robotic car is

based on information sent by phone to the robot. The results demonstrate that using only one's voice as a method of control, a user can learn to influence real world objects reliably. The proposed findings show that voice-controlled robotics would be effective in the future. This device could be used for a wide range of tasks.

In the future, systems such as washing machines, microwave ovens, and other home appliances will primarily be voice controlled. In this situation, the study would be able to effectively meet the current need. There's really not much space for the robot because it is so small. We can connect the robot from those few meters away because the link between both the robot and the host PC is Wi- Fi.

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