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SMART BLUETOOTH AND VOICE CONTROL CAR

Mr.M.RAMANA REDDY [(1)] , Mrs.N.SWARUPA RANI [(2)] , NETTURI SAI DINESH [(3),] SURE SUBHASH [(4),] KANIGIRI PAVAN KUMAR[(5),] VADLAMUDI VENKATA RAMANA [(6)]

[1,2] *Faculty ECE Department, Krishna Chaitanya Institute of Technology & Sciences-Markapur, AP, India.*

[3,4,5,6] *Student , ECE Department, Krishna Chaitanya Institute of Technology & Sciences,Markapur, AP, India.*

ABSTRACT

This paper was developed in a way that the car is controlled by voice commands. An android application with a microcontroller is used for required tasks. The connection between the android app and the vehicle is facilitated with Bluetooth technology. The car control by buttons on the application or by spoken commands of the user. The future advancement in this technology will help us in for the handicapped ones who cannot drive the vehicle on their own, transportation purposes, hazardous environment places where human interaction might be impossible and so on. Also, the use of sensors will provide greater safety from sudden hits. A Bluetooth module is used to create a communication link between the car and human voice commands via Android Application. The RF transmitter of the module can take human voice commands through the application which will then be converted into encoded digital data up to an adequate range of 100 meters from the robot. The receiver of the module decodes the input data before feeding it to the microcontroller to drive DC motors via motor driver L298D for necessary movements. An Arduino UNO which is the brain of our system is programmed to read voice commands and respond accordingly. Obstacle detection can be done by ultrasonic sensors interfaced with the Arduino UNO. Considering this feature, in the future it might prove a milestone in vehicle automation.

I INTRODUCTION

Embedded systems refer to computer systems that are designed to perform specific tasks within a larger device or system. These systems are typically programmed to perform a specific function or set of functions, with limited resources such as memory, processing power and power consumption. They are also often designed to operate in real – time, responding to external stimuli are events within strict time constraints. Embedded systems are used in a wide variety of devices, including smartphones, automobiles, medical devices, industrial equipment, and more. They can range in complexity from simple microcontrollers to more advanced systems that include multiple processors and complex software. Embedded systems are typically programmed using low-level languages such as C or Assembly and often required specialized hardware interfaces and drivers to interact with the external world. They may also incorporate real- time operating systems or other software frame works to manage system resources and handle systems-level tasks. The development of embedded systems involves a variety of disciplines, including hardware design, software development, and system integration. The process typically involves designing and implementing the hardware, developing the software that will run on the system, and testing and debugging the system to ensure that it performs as intended.

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II LITERATURE SURVEY

Alice Joseline and Mrs. S. Benila . (2018) This paper introduced the voice recognition concept for easy identification and assembly of parts for auto motives of a car. The system is suitable for real time implementation of manufacturing process. The project consist of Artificial Intelligence algorithms such as speech recognition decision making planning algorithm.

Prof. Bhuvaneshwari Jolad, Mohnish Arora, Rohan Ganu and Chetan Bhatia . (2018) The main purpose this project is to have control on the movement of vehicle by using voice command. The command will be send by using the android application which will be connected to robotics car through Bluetooth module. This system contains transmitter to convert analog voice commands to digital word sequence. Receiver MAX 232 transceiver is used to decode the received signal for serial communication with the Bluetooth module.

Hans Tiwari and Ashish Jha . (2019) This project is consists of an autonomous vehicle, which is controlled using specific voice commands defined for a particular action. The Alexa is used to transfer voice command to the car.. .

R. Veeramani, R. Madhan Mohan, Deepak Prajapati, Aman Kumar and Sidharth Kumar. (2019) The main objective of this proposed system is to develop a robotics car which can be controlled and perform certain action by human voice or speech, or command and this project aim to reduce the parking problem and also to utilize it on the defence sector.

C. Jeeva, Anwar Naseer Khan, Junaid Azad Wani and Amit Kumar. (2016) In this paper the goal of Voice Sensor Vehicle is to listen and act on the commands received from the user. Earlier some implementation has been done on this technology. The previous work included the variation of the speed of the vehicle in zones like school, hospital, U-turn and highway for accident prevention. The paper contains a smart zone-based vehicle speed control by Using RF and obstacle detection and accident prevention system. SO, the main objective of the project is when vehicle enters school (any institutional) zone or hospitals zone will reduce the speed of the vehicle with RF Module with respective place or We can reduce it with the Voice Based Module anywhere u can reduce the speed of the vehicle.

Arti Paswan, Ajay Kumar Gautam, Bhartendu Vimal, Farheen and Arun Kumar Mishra. (2019) In this project the prototype of the robotic car has been designed which can operate according to human voice. The prototype has been made by making the use of two technology mainly Human-Computer Interaction (HCI) and Human- Robot Interaction (HRI). The project also includes the utilization of IOT and wireless camera.

P R Bhole, N L Lokhande, Manoj L Patel, V D Ra Mahajan. (2017) The main objective of this project Is to make a robotics car operating with human voice, with the aim of reducing the human effort while driving a car. The proposed system also elaborates the use AI sensor on it.

III EXISTING METHOD

The current systems are robots like line follower robot, edge averting robot, DTMF robot, gesture controlled robot. These type of robots are not efficient since they require more power to run, cost is also very high. In the existing system they don’t use voice commands, making it not possible for physically handicapped people to drive. The voice commands are interpreted via an offline server in real time. The commands are at once transmitted to the server directly by the means of a wired network. The car is built primarily on a platform based on a microcontroller. Some of the fields that can likewise be equally enhanced are the effect of the mouth- microphone range on the robotic, the overall performance (scope) of the robot and the effect of noise on the translation of speech to textual content. In the existing system Bit Voicer Server is used, it's a database for speech processing and automation synthesis. It was designed to make voice operation possible with simple gadgets having low processing power. Microcontrollers usually do not have enough storage and computing ability to perform sophisticated speech treatment and synthesis. By doing the tough work Bit Voicer Server removes the consequences of these limitations so that the microcontroller can assign its key functionality to most of its origin sources.

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Disadvantages:

Security Risks: Smart Bluetooth and voice control systems rely on wireless connectivity, which means they may be vulnerable to hacking and cyber - attacks. Hackers could potentially gain access to sensitive information or even take control of the vehicle's functions. Limited Functionality: Some voice control systems may not be able to perform certain functions or control certain features of the car, which could be frustrating for users. Distraction: While voice control can be a safer option than physically interacting with the car's controls, it can still be a distraction while driving, as it requires the driver's attention and mental effort. Compatibility Issues: Smart Bluetooth and voice control systems may not be compatible with all mobile devices, which could limit their usefulness for some users. Cost: Some smart Bluetooth and voice control systems can be expensive to install, and may require additional hardware or software upgrades to function properly, adding to the overall cost of the vehicle.

IV PROPOSED SYSTEM

In this proposed device we perform a variety of research on control style variants for robots. It shows that it's feasible to study to successfully manipulate actual world objects with solely voice (human voice) as a control mechanism. The reason of this lookup is to provide simple robotic hardware architecture so that this shape can focal point on Bluetooth connection infrastructure. It is also beneficial for academic robotics due to the fact human beings can construct their personal robots with low cost. When the app is operating in the system, a microphone on the mobile is used to identify user voice commands. Commands are interpreted and the program utilizes Google's speech-recognition software to translate voice to text within the app. The text will then be sent with the aid of Bluetooth to the receiver part. The microcontroller Arduino UNO R3 has 32kB of ISP flash memory, 2kB of RAM and 1kB of EEPROM.

A smart Bluetooth and voice-controlled car is a type of vehicle that utilizes advanced technology to provide users with a more convenient and safer driving experience. This type of car is equipped with Bluetooth technology, which allows drivers to connect their mobile devices to the car's audio system, enabling them to stream music, make phone calls, and access other features hands-free. The Bluetooth connectivity allows the car to connect to a smartphone or other Bluetooth-enabled devices, enabling hands-free calling, Additionally, a smart Bluetooth and voice-controlled car also comes with voice- activated controls that allow drivers to perform various functions without having These functions may include adjusting the temperature and audio settings, navigation, and even controlling the car's acceleration and braking.

Block Diagram:

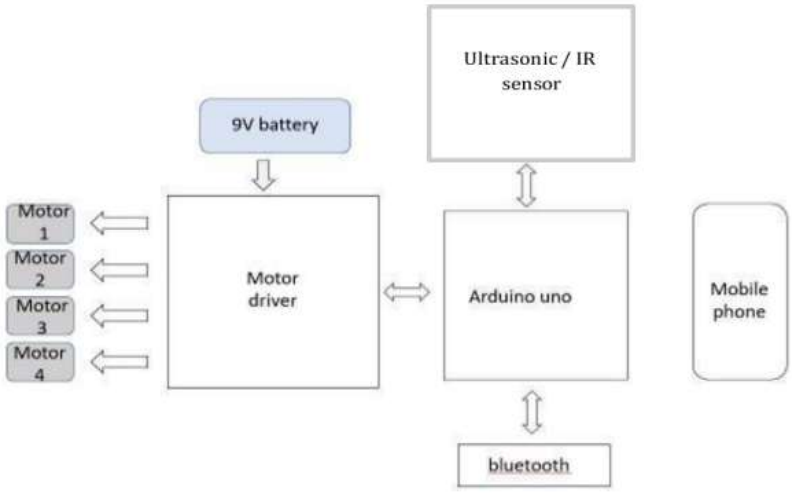

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Fig 1: Block diagram of smart Bluetooth and voice control car

The block diagram of the simple voice controlled robotic vehicle is given it consists of the smartphone that recognizes the voice commands and are being wirelessly transferred to the Bluetooth module HC05. The module at that point changes over the order to content and the series of characters are sent to the Arduino for additional handling. signals are sent to the motor that hence powers and drives the motors connected to it. On the Transmitter area, commands are given to the Mobile Application through the mic. This portable handset is associated with the moving vehicle by means of Bluetooth module. The portable application utilized, is modified so that the voice orders given to the handset are received by the mic and these simple voice orders are changed over to advanced word successions (A to D transformation). These stored sequences are than transmitted to the robotic vehicle via Bluetooth transceiver module and are sent to the transceiver controller. Android application transceiver is used to decode the received signal with the Bluetooth module. The controller contrasts these signals and the put away program orders in it and convert them into voice strings. The voice strings are then used to run the servo engines for the ideal interval of time. The yield of the Arduino goes to the engine driver IC and it controls the specific.

Steps to control the robotic vehicle.

- ✓ Install any Bluetooth Application for Arduino
- ✓ Pair HC-05 Bluetooth module with the mobile
- ✓ Default password is “1234” or “0000”
- ✓ Click on the “MIC” icon and speak/instruct the robot
- ✓ On speaking our speech gets recognized and converted into text. That text is transferred using Bluetooth.
- ✓ The Bluetooth Module receives the string, decodes it and compares it with the Instructions that are described in the program and moves the robot in forward direction , backward direction , left and right

V RESULTS

Robot is controlled through voice command s given by the user who is operating the project.

- ✓ These voice commands needs to be given through an android app which is installed on the users android mobile.
- ✓ Speech recognition is done within the android app and then a respective command is sent to the voice controlled robot vehicle.
- ✓ Microcontroller filled on the vehicle decodes these commands and gives an appropriate command to the motors connected to vehicle.

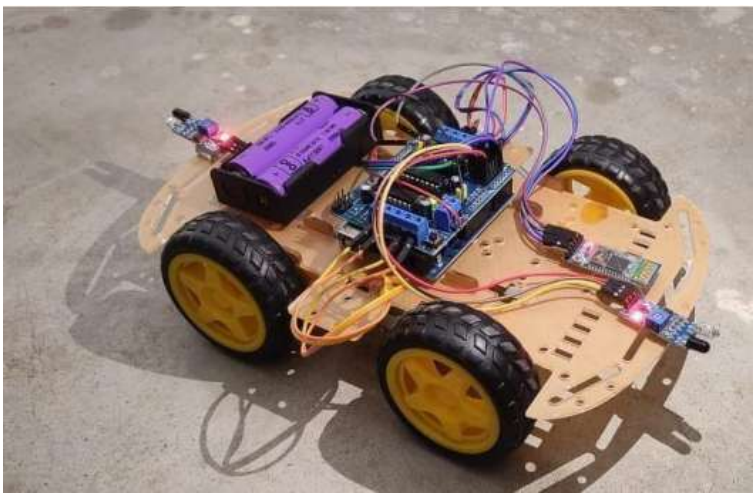

Fig 2: Smart Bluetooth and Voice controlled car (side view)

VI CONCLUSION

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The “Voice Controlled and Bluetooth car” project has many applications and in present and future. The project can be made more effective by adding features to it in the future. The project has applications in wide variety of areas such as military, home security, rescue missions, industries, medical assistance etc. We were successful in implementing a simple model of voice controlled robotic vehicle using the available resources. The implementation of this project is easy, so this robot is beneficial for human life. The Voice Control Robot is useful for disable people and monitoring purpose. It works on simple voice command, so it is easy to use. It is useful for those areas where humans can’t reach. The size of this robot is small, so we can use this robot for spying purpose. It can be used for surveillance. We can implement web cam in this robot for security purpose. The voice recognition software has an accuracy and for identify a voice command and it is also highly sensitive to the surrounding noise.

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