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Voice Controlled Car

Miss. N. S. Sasane[1], Shahid Shaikh[2], Jotiba Fadtare[3], Kashish Nirankari[4], Janhavi Powar[5]
Lecturer, Department of Electronics and Telecommunication Engineering[1]
Students, Department of Electronics and Telecommunication Engineering[2,3,4,5]
Sanjay Ghodawat Institute, Atigre, India

Abstract: *A system is being proposed, which focuses on the concept of how a car can be controlled by the human voice. Voice control car is just a practical example of controlling motions of a simple car by giving voice commands. In this system, an android app is used for the transmission of human commands to Arduino. An Arduino can be interfaced with the Bluetooth module through the UART protocol. The speech is received by the android app and processed by the voice module. Voice is then converted to text. The Arduino will further process this text, which will take suitable action to regulate the robot. The objective is to design a robotic car whose basic movements such as moving forward, turning to left or right can be controlled by the human voice.*

Keywords: Arduino, Voice.

I. INTRODUCTION

In the era of rapid urbanization and advancing technology, the need for smarter, more sustainable urban infrastructure is paramount. Street lighting, a fundamental component of any city, presents a unique opportunity for innovation and efficiency enhancement. operational costs and adverse environmental effects. To address these challenges, our project, the "Smart Street LightingSystem with IoT Integration," proposes a forward-thinking solution. This initiative leverages the power of the Internet of Things (IoT) to transform traditional street lighting into an adaptive, data-driven system that responds intelligently to real-timeconditions.

In this project, we outline a comprehensive approach to modernizing street lighting, with a focus on energy efficiency, fault detection, cost savings, environmentalsustainability, safety enhancement, user-friendliness, data driven decision-making, scalability, integration with existing smart city infrastructure, and community engagement. By combining IoT technology with cutting-edge data analytics and responsive control mechanisms, we aim to create urban environments that are not only well-lit but also environmentally responsible, cost-effective, and responsive to the needs of the community.

II. LITERATURE SURVEY

[1] Shiropa Chakraborti Proposed:

The robot car prototype is designed using Human Robot Interaction (HRI), which is controlled by user-specific commands provided by the robot user. This prototype is designed to overcome the problems of manual wheelchairs and provide a quality life individually for the physically handicapped.

[2] Rubina Liyakat Khan;

The purpose of this system is to construct a robotic car that can be operated with a human voice for basic actions like going ahead and turning left or right. We concludedthat, indeed, there is a very basic and straightforward solution effective method for controlling robots using human voice after doing a large number of tests on the subject. This is a simple robotic application approach.

[3] Aditya Chaudhry;

A system is being proposed, which focuses on the concept of how a robot can be controlled by the human voice. Voice control robot is just a practical example of controlling motions of a simple robot by giving daily used voice commands. Suchtypes of robots will provide great helping hands while performing multiple tasks.

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III. PROBLEM DEFINITION

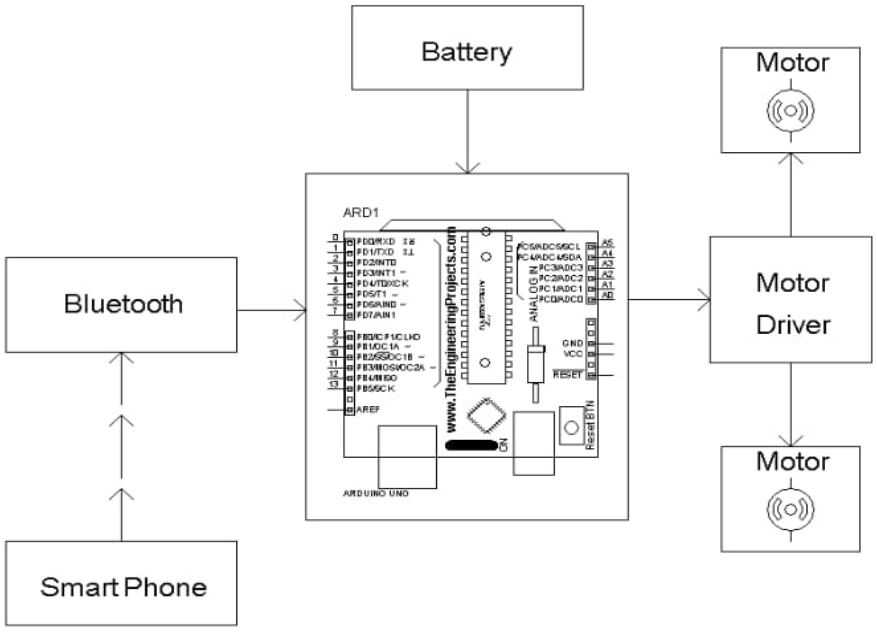
Objective show that it is indeed possible for a user to learn to effectively manipulate real world objects with only verbal voice as a control mechanism. The proposed results provide strong evidence that the further development of voice-controlled robotics will be successful. This system would find wide variety of applications. Mainly systems such as household appliances like washing machines microwave ovens etc. will become voice controlled in future. In such case this research will work out practically satisfying the need of the day efficiently

Objective:

The main objective of the project is to control the robotic vehicle in a desired position the movement of the robot either in forward, backward, left, right or stop directions

Bluetooth interfaced to Arduino. The robot is controlled by the voice commands

Block Diagram



IV. PROPOSED METHODOLOGY OF SOLVING IDENTIFIED PROBLEM

The main purpose of this project is to reduce manual effort. For controlling car we will use voice commands. There are some places where humans find it impossible to reach but where human voice can be heard, such as a small pipeline, or fire, or a particularly poisonous environment. So we are designing this project in such a way that voice instructions are used to control the robotic car.

System Components

Arduino

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. The ATmega328 on the board comes preprogrammed with a bootloader that allows uploading new code to it without the use of an external hardware programmer. While the Uno communicates using the original STK500 protocol, it differs from

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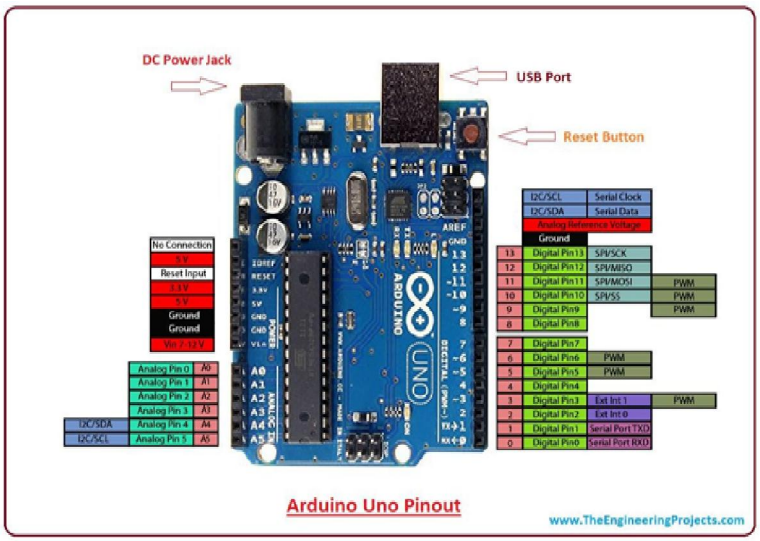
all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it uses the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to serial converter.

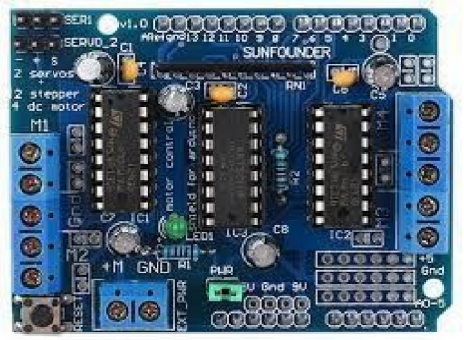


DC Motor

A DC motor is an electrical motor that uses direct current (DC) to produce mechanical force. The most common types rely on magnetic forces produced by currents in the coils. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current in part of the motor.

Motor Driver IC:

A motor driver is an integrated circuit chip which is usually used to control motors in autonomous robots. Motor driver act as an interface between Arduino and the motors L293D consist of two H-bridge. H-bridge is the simplest circuit for controlling a low current rated motor. We will be referring the motor driver IC as L293D only. L293D has 16 pins.



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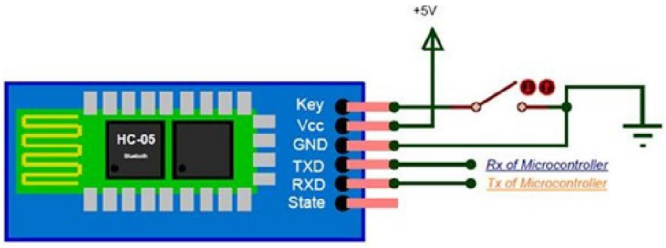
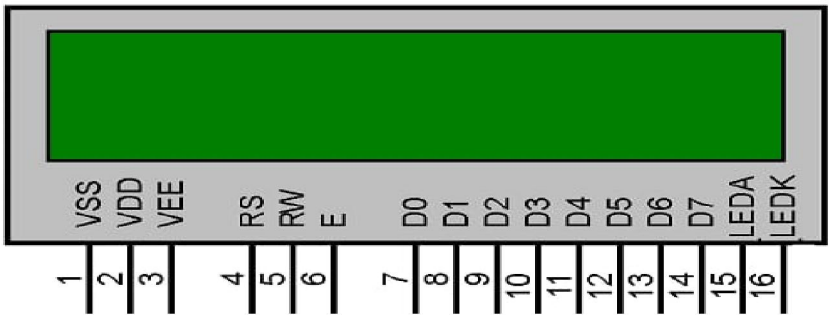
Bluetooth HC-05:

HC-05 is a Bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration. Bluetooth serial modules allow all serial enabled devices to communicate with each other using Bluetooth.



LCD Display:

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.



Benefits

- Fast data input operations
- Talking is much faster than typing
- Time saving

Advantages

- Cost-effective.
- The Robot is small in size, therefore less space required.
- As we are us camera which is attach to the robot so it will capture video which will be used for security.
- Low power consumption.
- No accident is done by improper driving of people and also available for elderly and disabled people

Applications

- Some real-world applications of this voice-controlled car are:
- The vehicle is useful in places where humans find difficult to reach but human voice reach. Such as in fire situations, in highly toxic areas.
- The vehicle can be used for monitoring or investigation.
- The voice controlled car can be easily drive by unskilled driver by using voice commands with the help of android application in smart phone.
- Telephone assistance system.

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V. CONCLUSION

The proposed framework of our project shows that how a robot can be control utilizing Bluetooth. The voice controlling orders are effectively transmitted through Bluetooth innovation and the desired activities effectively happen. This task lessens human endeavours at spots or circumstances where human intercessions are troublesome. Such frameworks can be brought into utilization at spots, for example, businesses, military and guard, investigate purposes, and so forth.

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