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Wireless DC Motor Speed and Direction Control System

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ABSTRACT: In the domain of robotization and controller, dealing with the speed and course of DC engines remotely offers critical benefits regarding adaptability and effectiveness. Using an ESP8266 microcontroller and a DC motor, this project presents a wireless system for controlling the speed and direction of a DC motor. The ESP8266, eminent for its Wi-Fi abilities, fills in as the center part in this framework, empowering consistent correspondence between the client and the engine. Through a web-based interface that is accessible from any device connected to the same network, users of the system are able to control the DC motor's speed and direction.

I. INTRODUCTION

Wireless technology has significantly altered the management and control of devices in modern automation and control systems. Using the ESP8266 microcontroller, the goal of this project is to create a wireless DC motor speed and direction control system. The ESP8266 is a strong, minimal expense Wi-Fi module that takes into consideration consistent incorporation with remote organizations, giving a powerful stage to controlling electronic gadgets from a distance.The creation of a system that enables users to wirelessly control the speed and direction of a DC motor via a web interface or mobile application is the primary objective of this project. Users are able to send commands over the internet by making use of the Wi-Fi capabilities of the ESP8266.

This makes it possible to adjust the parameters of the motor from almost any location. This framework tracks down applications in different fields, including mechanical technology, robotization, and remote-controlled vehicles, where exact engine control is fundamental.

II. EXISTING SYSTEM

Several technologies and components can be integrated into the ESP8266 to create a wireless DC motor speed and direction control system. The system typically consists of an ESP8266 module, which is the wireless controller, and a DC motor, which is managed by a motor driver module like the L298N or L293D. The motor driver is necessary for controlling the speed and direction of the motor by using digital signals to control the direction and PWM signals to adjust the speed. The ESP8266 has a web server that hosts a connection to a Wi-Fi network and enables web-based remote control. A straightforward HTML page with sliders or buttons for adjusting the motor's speed and direction can serve as this web interface. The ESP8266 receives HTTP requests from JavaScript on the webpage and processes them to control the motor driver in accordance.

2.1 DISDAVNTAGES

- Interference from Signals
- Limited Range
- Complexity
- Integration Problems

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III. PROPOSED SYSTEM

The ESP8266 microcontroller is used in this system to enable wireless network-based remote control of a DC motor's speed and direction. A motor driver module connected to the ESP8266 manages the motor's operation in response to commands from a web interface or mobile app. The ESP8266 is programmed to connect to a Wi-Fi network and houses a web server. This makes it possible for users to control the motor's direction and speed with digital signals using PWM (Pulse Width Modulation).For wireless communication, the system requires a DC motor, an ESP8266, and a motor driver module like the L298N or L293D. The motor driver uses the signals from the ESP8266 to control the motor's speed and direction. Through a mobile app or web interface that communicates with the ESP8266, users interact with the system. The engine's speed is changed utilizing PWM signals, while its course is constrained by setting proper pins on the engine driver module. For the motor and ESP8266 to function properly, the power supply must have sufficient power.

3.1ADVANTAGES

- Include Wireless Control
- Real-Time Feedback
- Low Power Consumption
- Ease of Integration.

IV. LITERATURE SURVEY

[4.1]. Apripriharta, Desi Fatkhi Azizah, Khen Dedes, and Agunf Bella Putra Utama "DC Engine Speed Modeling and Recreation Utilizing Fluffy Rationale Control Strategy", IEEE Access, 2021.

ABSTRACT

The paper presents a strategy for demonstrating and reenacting the speed control of a DC engine utilizing a fluffy rationale control (FLC) technique. Utilizing the adaptive and heuristic nature of fuzzy logic to enhance motor performance, the authors focus on overcoming the drawbacks of conventional control methods. A fuzzy logic-based controller with the goal of improving the responsiveness and accuracy of DC motor speed control systems is being developed as part of the research. Through simulations, the proposed model's effectiveness in controlling speed with less overshoot and more stability is shown to be superior to that of conventional approaches. Fuzzy logic has the potential to improve DC motor control applications, as shown by the findings.

[4.2]. Abhishek Sahu, Bushra Khan, Shiv Kumar Atahar Bag, and Vinod Kumar Singh Speed and Direction Control of a DC Motor Using Arduino and Bluetooth HC-05," IEEE Access, 2020.

ABSTRACT

The paper investigates a framework for controlling the speed and heading of a DC engine utilizing an Arduino microcontroller and a Bluetooth HC-05 module. The proposed framework considers controller of the DC engine by means of a Bluetooth-empowered gadget, for example, a cell phone. The control mechanism, which includes sending commands from a mobile application to the HC-05 module, is described in detail by the authors. The Arduino then interprets these commands and adjusts the speed and direction of the motor accordingly. The system shows how to control motors in a way that is both effective and easy to use. It also shows how easy it is to integrate and control the system using Arduino and Bluetooth technology.

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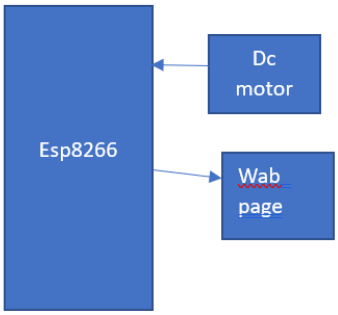
V. BLOCK DIAGRAM

BLOCK DIAGRAM



VI. HARDWARE REQUIREMENTS

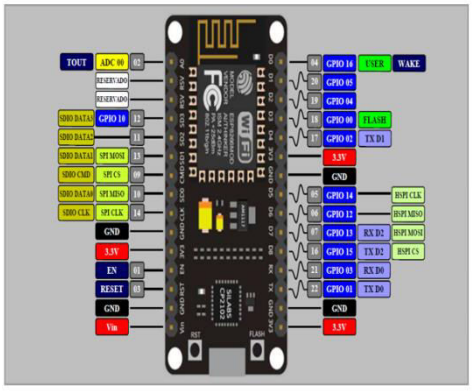
- ESP8266
- DC MOTOR

VII. SOFTWARE REQUIREMENTS

- ARDUINO IDE
- WAB PAGE

VIII. HARDWARE DISCRIPTION

8.1ESP8266



NodeMCU Advancement unit gives admittance to these GPIOs of ESP8266. The only thing to keep in mind is that the pins in the NodeMCU Dev kit are numbered differently than the ESP8266's internal GPIO notations, as shown in the figure and table below. For instance, the D0 nail to the NodeMCU Dev pack is planned to the inside GPIO pin 16 of ESP8266.The Web of Things (IoT) has been a moving field in the realm of innovation. It has altered our working practices. More than ever before, digital and physical worlds are connected. In light of this, Expressive Systems, a

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semiconductor company based in Shanghai, has released the adorable ESP8266 microcontroller, which is capable of monitoring and controlling things from anywhere in the world and is equipped with Wi-Fi.

8.2 DC MOTOR

Direct Current motors are machines that convert DC electrical power into mechanical power. The working of DC motors is based on the idea that a conductor that carries current experiences a mechanical force when placed in a magnetic field. An electrical device that converts electrical energy into mechanical energy is known as an electric motor. The fundamental working standard of a DC engine is: " A mechanical force is applied to a current-carrying conductor when it is placed in a magnetic field. Fleming's left-hand rule indicates this force's direction and magnitude by formula F = BIL. Where, B = attractive motion thickness, I = current and L = length of the guide inside the attractive field.

IX. SOFTWARE DISCRIPTION

9.1 ARDUINO IDE

Programs composed utilizing Arduino Programming (IDE) are called draws. The file extension.ino is used to save these sketches, which were written in the text editor. The editor has tools for searching and replacing text as well as cutting and pasting. The message region gives input while saving and trading and furthermore shows blunders. The Arduino Software (IDE) outputs text to the console, which includes all of the information, including complete error messages. The base righthand corner of the window shows the designed board and sequential port. You can open the serial monitor, create, open, and verify programs, and upload and upload programs using the toolbar buttons.

ArduinoSoftware(IDE)

9.2 WABPAGE

A page (likewise composed as website page) is a particular assortment of data given by a site and showed to a client in an internet browser. A site commonly comprises of many website pages connected together in a rational style. The primary component of a web page is one or more text files written in the Hypertext Markup Language (HTML), which is why the term "web page" is used as a metaphor for paper pages that are bound together. Many pages additionally

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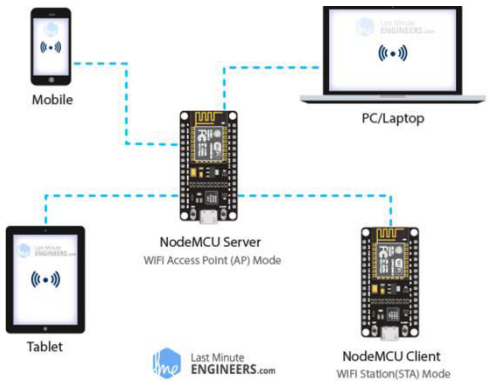
utilize JavaScript code for dynamic way of behaving and Flowing Templates (CSS) code for show semantics.[1] Pictures, recordings, and other media documents are likewise frequently implanted in website pages.



X. CONCLUSION

The remote DC engine speed and bearing control framework utilizing the ESP8266 has exhibited an exceptionally compelling methodology for overseeing engine works from a distance. The system makes it possible for users to control the motor's speed and direction from a distance via a web interface or mobile app by making use of the Wi-Fi capabilities of the ESP8266. This increases operational flexibility.

The system's main advantage is its seamless wireless connectivity, which makes it possible to manage the system remotely from any device that is connected to the same network. Users can operate the motor without physically being at the control site thanks to this wireless communication, which makes the process of controlling the motor easier.

REFERENCES

[1]. Aripriharta, Desi Fatkhi Azizah, Khen Dedes, and Agunf Bella Putra Utama "DC Engine SpeedModeling and Recreation Utilizing Fluffy Rationale Control Strategy", IEEE Access, 2021.
[2]. Abhishek Sahu, Bushra Khan, Shiv Kumar Atahar Bag, and Vinod Kumar Singh Speed and Direction Control of a DC Motor Using Arduino and Bluetooth HC-05," IEEE Access, 2020.
[3]. Amar Merzga, Hichem Laib, and Fateh Moulahcene IEEE Access, 2022, "Angular Position Control of DC Gear-Motor Using PID Controllers for Robotic Arm."
[4]. Jarwany, Majili nema hawas, and Mohannad Jabbar Mnati are Hayder Jasim Habil. Raspberry Pi 4 andPython In view of Speed and Heading of DC Engine", IEEE Access, 2022.
[5]. Xu Mingqi." IEEE Access presents "Control of DC motor adjustable speed electric vehicle based on PSO-PIDalgorithm optimization research."
[6]. S. Khiradkar 2, Arati S. Sindhimeshram3, Chaitrali P. Dhenge4, Kunal K. Kamble5, Pratiksha Panchabhai6 1,2,3,4,5UG Understudies, Dept. Department of Electrical Engineering, JDCOEM, Maharashtra, India of Electrical Designing, JDCOEM, Maharashtra, India.
[7]. Utilizing Internet of Things (IOT) to enhance speed monitoring and motor control, Mr. P. Balaji, 2Mr. A. Karthick, 3Mr. 4Mr. R. Murali M. Sudhakaran, 1,2UG Understudy, Dept. 3Assistant Professor, Dept. of EEE, Ganadipathy Tulis's Jain Engineering College, Vellore, India 4Associate Professor, Dept. of EEE, Ganadipathy Tulis's Jain Engineering College, Vellore, India of EEE, Ganadipathy Tulis' Jain Designing School, Vellore, India.

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