UIU Smart Transportation Service

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Abstract

The main concept of our project is to reduce accident in the highway by using artificial intelligence. It is highly safe, works accurately and can be used in any vehicle. Today, technology has made the unbelievable and impossible things possible and solved many problems. First, this project is combination of several ideas to make things safe, simple, economical friendly. The installation prosses of this project is very easy so that we can install it any vehicle.

Keywords: reduce, artificial, intelligence, installation

1 Introduction

The necessity of this project is because the road accident is increasing day by day. There has been an alarming rise in the number of road accidents in Bangladesh over the last few years. The number of accidents and fatalities has continued to increase from 2020 to 2021. According to the Bangladesh Road Safety Foundation's (RSF) annual report, at least 6,284 people died, and 7,468 others were injured in road accidents between January and December 2021, compared to 5,431 people dead and 7,379 injured in road collisions in 2020.

Meanwhile, according to Nirapad Sarak Chai (NSC-We Demand Safe Roads), 4,289 people died in 3,793 traffic accidents in 2021. The project is not only applicable in car or bus but also applicable in all kind vehicle.

Fig. 1 UIU Smart Transportation demo

2 Facility

It works automatically. While driving if any vehicle behind me is speeding up and there is a risk of a collision with my car, my car will also speed up to avoid collision. If a car in front brakes suddenly, my car will also brake. If there is an opportunity to go right or left during jam, my car will go in that direction to avoid the jam.

3 Components

- Relay(5v)
- L298N Motor Driver Module
- Lithium battery (3.7v)
- Type C charger Module
- ESP32 (38pin)
- Jumper (Male & female)

- 3pin Connector (male & female)
- 4WD Smart Robot Chassis Kit
- Dual Shaft 200 RPMBO gear
- 3-AAA Battery holder
- Ultrasonic Sonar Sensor HC-SR04

4 COMPONENTS SPECIFICATIONS

4.1 ESP32 (38pin):

The ESP32 chip comes with 48 pins with multiple functions. Not all pins are exposed in all ESP32 development boards, and some pins cannot be used. Not all GPIOs are accessible in all development boards, but each specific GPIO works in the same way regardless of the development board we are using. If we are just getting started with the ESP32.

Fig. 2 ESP 32

4.2 L298N Motor Driver Module:

L298N Motor Driver Module is a high-power motor driver module for driving DC and Stepper Motors. This module consists of an L298 motor driver IC and a 78M05 5V regulator. L298N Module can control up to 4 DC motors, or 2 DC motors with directional and speed control.
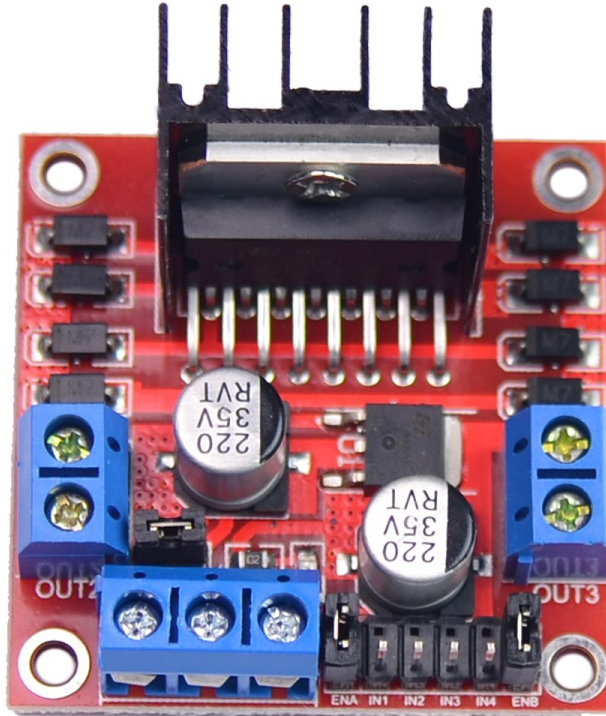

Fig. 3 L298N Motor Driver Module

4.3 Relay(5v):

A 5v relay is an automatic switch that is commonly used in an automatic control circuit and to control a high-current using a low-current signal. The input voltage of the relay signal ranges from 0 to 5V.
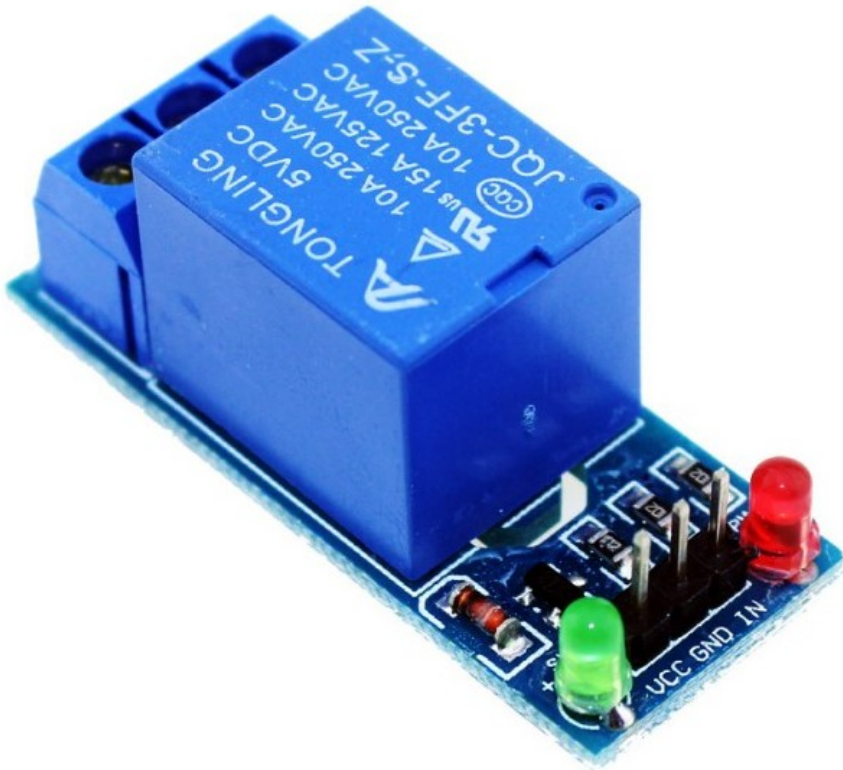
Fig. 4 Relay

4.4 Ultrasonic Sonar Sensor HC-SR04:

An HC-SR04 ultrasonic distance sensor actually consists of two ultrasonic transducers. One acts as a transmitter that converts the electrical signal into 40 KHz ultrasonic sound pulses. The other acts as a receiver and listens for the transmitted pulses. When the receiver receives these pulses, it produces an output pulse whose width is proportional to the distance of the object in front. This sensor provides excellent non-contact range detection between 2 cm to 400 cm (13 feet) with an accuracy of 3 mm. Since it operates on 5 volts, it can be connected directly to an Arduino or any other 5V logic micro-controller.

4.5 Dual Shaft 200 RPMBO gear:

The 200 RPM Dual Shaft BO Motor - Straight motor gives good torque and rpm at lower operating voltages, which is the biggest advantage of these motors. Small shaft with matching wheels gives an optimized design for our car. Mounting holes on the body & light weight makes it suitable for in-circuit placement. This motor can be used with 69mm Diameter Wheel for Plastic

Fig. 5 Ultrasonic Sonar Sensor HC-SR04

Gear Motors. It is an alternative to our metal gear DC motors. It comes with an operating voltage of 3-12V and is perfect for building small and medium robots

4.6 4WD Smart Robot Chassis Kit:

2xCar chassis (The color is transparent),
    4xDC gear motor,
    4xYellow wheels,
    1×4-AA-L Battery box,
    4×20 line tachometer encoder,
    8xFastener,
    1x3D assembly drawings (Chinese version),
    Several pillars screw nut, from 0 to 5V.

5 Conclusion

By the way of concluding, this project is good at cost efficient and easy in assembling the circuit also highly efficient in mans of practical if our project come into existence vehicle accident will definitely drop to 60%-70% in a year in Bangladesh.

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