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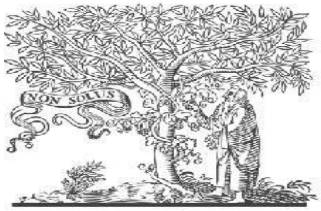

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AUTOMATIC VEHICLE SPEED CONTROL SYSTEM

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ABSTRACT

Most people nowadays drive so quickly that accidents happen so regularly that people lose their valuable lives by making minor mistakes when driving in school zones, industrial zones, mountainous areas, and highways. So, in order to avoid such accidents and inform drivers, as well as restrict vehicle speed in such situations, the highway department must have put up signboards. Accidents happen all the time in high-traffic locations. Most drivers drive aggressively with little regard for traffic.It is critical to inform the driver of the speed. It is possible to accomplish this by utilising the automatic system with the assistance of the embedded system and sensors that we will be employing. This project will concentrate on "automatic speed control of vehicles" by detecting overspeed. The goal is to create a smart display controller for vehicle speed control and zone monitoring that can run on embedded devices.

KEYWORDS: Arduino UNO,IR sensors,MQ3 Alcohol sensor,DC fan motor

1.Introduction

It is obvious that road accidents are increasing on a daily basis. To prevent road accidents and create a calm and good atmosphere for people. Because of the drivers' aggressive and reckless driving, conventional approaches cannot be used to reduce accidents. As a result, speed control must be included in all cars.Automated speed control system in automobiles, primarily in congested locations.

When the vehicle achieves the above-specified speed and is controlled by placing the receiver on the vehicle, the microcontroller's interface reduces the vehicle's speed. The dc motor detects the current speed of the vehicle and provides its output to the microcontroller, which compares the speed to a predetermined limit and automatically adjusts the speed in the circuit.

As a result, this system is capable of regulating and monitoring the vehicles in the covered area. This strategy can help decrease accidents in today's fast-paced society. People in both developed and developing countries are irritated by road accidents and car jamming because drivers refuse to observe the rules and laws in restricted zones, where the speed must be reduced as defined in the zone by utilising an automated speed control system to limit the speed automatically.

We are using alcohol sensors because we are witnessing many accidents due to drunk driving, and this alcohol sensor is able to make sure that if the driver has drank, the vehicle will not start, which is one of the huge benefits of using the alcohol sensor. This automatic vehicle speed control system ensures that accidents will be reduced and people will be safe.

1.1 Problem identification

In the existing system, the vehicle speed control can be controlled manually. To control the vehicle speed automatically, we use IR sensors that can send IR signals to zones of the areas such as schools, hospitals, and factories. By using this, we can control the vehicle speed automatically even if we are unable to control the speed.

And we are also using an alcohol sensor in it because we are witnessing many accidents due to drunk driving, so this alcohol sensor can make the vehicle unable to start if the driver has drank, which is one of the huge benefits of using the alcohol sensor in this automatic vehicle speed control system. MQ3 alcohol sensor that we are using here for the sensing the alcohol and that by sensing that alchol the vehicle will not able to start so, by that a drunken person will not able to start the vehicle.

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2.Proposed System

In the proposed system we the IR sensors consisting the transmitter and receiver that able to control the vehicle speed and detects the zone like school,industrial, any restricted areas the speed will automatically decreases. In the transmitter side, we will be having an encoder and IR transmitter. In the receiver side we will be having the IR receiver which works for the speed control. And we also using alcohol sensor in it because we are witnessing many accidents due drunk and driving so this alcohol sensor able to make that if the driver has drank the vehicle able to not start that is one of the huge advantage by using the alcohol sensor this automatic vehicle speed control system makes that the occurance of the accidents that are able to reduce and make sure that people will able to be safe.

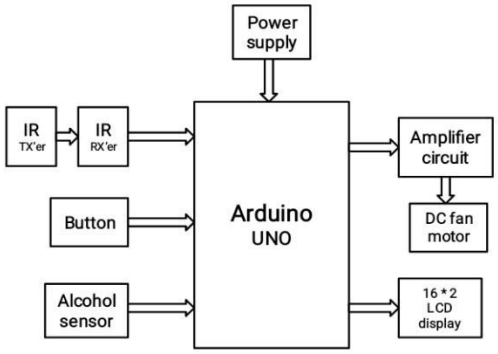

Fig : Block diagram

2.1 Operation of the System

When the vehicle is operating regularly, its speed does not drop, and there is no action that can be performed. When a vehicle enters a restricted location, such as a school, college, hospital, or hill, it enters a speed limitation zone. When it enters restricted regions, the IR transmitter emits an IR signal that provides information about how fast a vehicle can travel there. The information collected by the IR receiver and the signal obtained from the speed metre are then fed into the Arduino Uno microcontroller.The Arduino board's pins that provide PWM output are used to regulate the speed of motors.Signals are analogue in nature and will be transformed to digital so that only the microcontroller can process them. The Arduino controller compares the signal from the transmitter.There are two options in this situation. The first possibility is that the vehicle's present speed is less than its transmitted speed, in which case no action is necessary.When the current speed exceeds the communicated speed, the controller's transmitter module transmits a signal to the LCD display, which informs the driver of the limited speed in that zone. If the driver is unable to reduce the speed, the controller takes over and reduces the vehicle's speed accordingly.After that at the end of the restricted area it stop. The control released by the controller to driver. Once the information is received from the transmitter, it compares the vehicle speed with information obtained for the transmitter. If vehicle speed is below the restricted area speed, the controller will not sends any signal to the servo motor, hump is flat. so that vehicle moves smoothly without any kind of disturbance. If the vehicle speed exceeds the restricted area speed, the controller sends a signal to the LCD display and servo motor. As a result, the message is displayed on the LCD, and a hump is raised on the road.We use an alcohol sensor because riding a bike increases the likelihood of an accident; therefore, if the user consumes alcohol and then attempts to start the bike, the vehicle will not start. As a result, the LCD display indicates that alcohol has been detected, and the vehicle will not start.

3.Flow chart

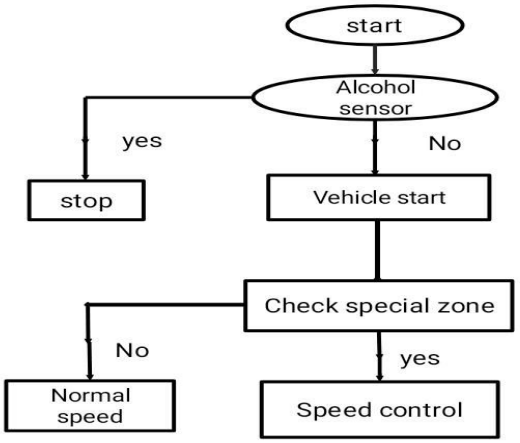

Figure: Flow Chart

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4.System Design

1. Arduino UNO

Arduino is a programmable circuit that is simpler to use and has opensource hardware and software. It has a robust natural constitution and can sustain objects with ease. This emphasizes the ATmega328. It has a USB interface, an ICSP connection, 6 analogue outputs, 14 digital I/O connectors, a power jack, and a reset switch. To dump software, utilize the USB port. The power supply is housed in a power jacket.

The battery being utilized is a 12V/1Amp battery either power required to run the card can be supplied by connecting it to the laptop through USB or by connecting an ACDC's power supply.

Figure: Arduino Uno

2. Alcohol Sensor

The alcohol sensor is one of the most frequent sensor types. MOS is an abbreviation for Metal Oxide Semiconductor Sensor. Metal oxide sensors are also known as chemical resistors because they detect changes in sensing material resistance when exposed to alcohol.When the surface of the SnO2 semiconductor layer is heated to a high temperature, oxygen is absorbed. When the air is pure, electrons from the tin dioxide conduction band are drawn to the oxygen molecules. This depletes the electrons in the layer immediately beneath the SnO2 particles' surface, resulting in the formation of a potential barrier. As a result, the SnO2 layer becomes extremely resistive, stopping the flow of electric current.

Figure: Alcohol Sensor

3. IR Sensors

The term "infrared radiation" refers to infrared radiation. Infrared light is a region of the electromagnetic spectrum that is placed just below the red section of typical visible light and at the opposite end of ultraviolet light. Despite the fact that invisible infrared operates on the same principles as visible light, it can be reflected and pass through clear materials such as glass.

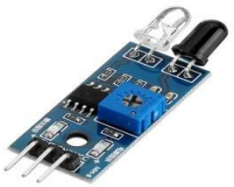

Figure: IR Sensor

Infrared remote controls communicate with home cinema equipment using invisible light, and all of them include infrared receivers positioned on the front that emit high-speed pulses of light.When the equipment recognises the signal and responds to the commands.

4. LCD 16*2 Display

A liquid crystal display (LCD) is a compact flat display device made up of any number of colour or monochrome pixels that are arranged in front of a light source or reflector. Each image is composed of a column of liquid crystal molecules suspended between two transparent electrodes and two polarising filters in the LCD with perpendicular polarity axes.

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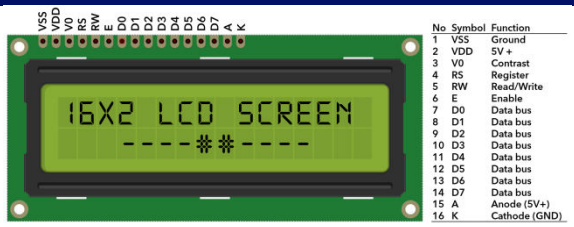

Figure: LCD

Light would pass through one but be stopped by the other if there were no liquid crystals between them. The liquid crystal is twisted. Light entering one filter is polarised, allowing it to flow through others.

5.DC fan motor

The DC fan motor uses a split-ring commutator and either a winding or a permanent magnet stator to generate oscillating current in the rotor. A rotor is a device that is powered by a battery and consists of a coil wound around a rotor.

Figure: DC fan motor

6.Button

A switch is a mechanical device that allows you to connect or disconnect an electric circuit quickly.Industrial operations can use subminiature switches to switch megawatts of electricity on high-voltage distribution lines. Mechanical switches have long been supplanted by electronic switching devices, which may be automated and intelligently handled in telephone service applications that demand a large number of switching possibilities.

Figure: Button

A push-to-break switch, on the other hand, breaks the contact when pressed and restores it when released. A push-to-break switch is a button that allows an electromagnetically held door to be opened. There are changeover push-button switches, but they are far less prevalent.

5.Implementation

The outcomes of the automatic vehicle speed control system are displayed below. The project kit depicts the Arduino Uno and IR sensors, which can play critical roles in making the kit show the output, as shown in the figure below.

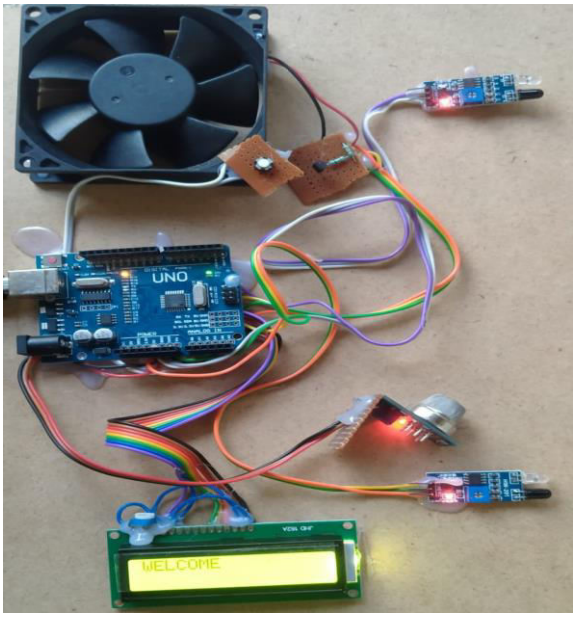

Figure: kit of automatic vehicle speed control system

6.Result

The button is provided in the kit to start the vehicle the amplifier circuit is

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provided in the kit for the working dc fan motor and IR sensors is able to control the vehicle speed automatically and in LCD display it shows the output of the vehicle speed control.

Figure: Normal speed indicating in LCD

So, if the any special zone such as the school,hospital zones it able to show that special zone occurred in the dc fan motor that the motor speed reduces slowly and it displays in the LCD.

Figure: special zone indicating in LCD

We use alcohol sensor because if a person ride the bike the occcurance of accident is more so the alcohol sensor is used in it if the person drinks the alcohol and want to start the bike the vehicle will not able to start. So in LCD display it shows as alcohol detected so the vehicle will not start.

Figure: Alcohol detected indicating in LCD

7.Conclusion

As a result, we determined that automatically lowering the vehicle's speed and contributing to the safety of passengers and road users would be advantageous. The use of vehicle speed control systems has been found to significantly minimise the number of accidents caused by driver negligence in ignoring roadside signboards in zones.Though the IR sensors that control the vehicle speed automatically in a vehicle are successful, they contribute significantly to increasing safety and keeping both passengers and others on the road safe. In school and hospital zones where the vehicle can act independently to slow down In addition, we use an alcohol sensor, which prevents the vehicle from starting if the driver is intoxicated. This is the most effective technique to prevent accidents. As a consequence of the above research, we discovered that using automatic vehicle speed control systems in restricted zones reduces speed.

8.Future scope

We may alter the system by using GPS to detect specific zones. Furthermore, we can adjust the system's efficient braking system in conjunction with air flow management to the carburettor. This technique can be used more successfully for any type of automobile, including buses, trucks, cars, and motorcycles. We may also use the GSM module to send SMS messages to mobile phones concerning speed and to signal speed reduction.

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