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Superlative Vehicle

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Abstract Social and human demands promote the development of automobile technology. For general vehicles, the auxiliary driving or automated driving is from a safe and comfortable level to solve human driving requirements. As the growth of the social demand for cultural and health care, the demand is bound to be reflected during the vehicle driving. It is important to consider the driver who may be in fatigue, illness and disability. In this paper, we aimed to provide maximum customization satisfaction for all drivers by introducing three special and unique features particularly for existing vehicles along with the consideration of safety of drivers in emergency situations.

Keywords ADD-automatic dim-dipper, Geo tagging, GPS and GSM module

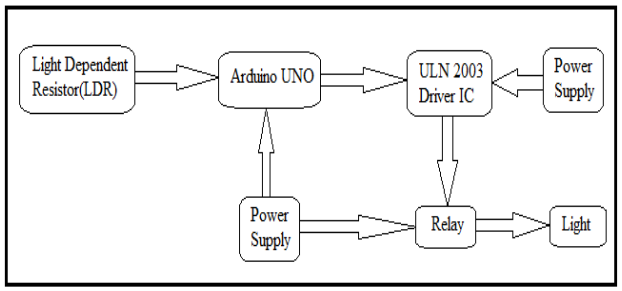
1. Introduction

This project is focused on three special features namely ADD system, Smart braking system and Geo-Tagging system. ADD system keeps the correct head light lighting power in accordance with the opposite vehicle light or any light source intensity. By knowing the opposite vehicle light intensity value, the brightness of the light is varied. This system is accurate, reliable and provides comfort to all drivers during night time. Smart braking system used to keep the vehicle secure and protect it by the occupation of the intruders. Many accidents at High-ways are taking place due to the close running of vehicles, all of sudden, if the in front vehicle driver reduces the speed or applied breaks, then it is quite difficult to the following vehicle driver to control his vehicle, resulting accident. To avoid this kind of accident, Smart braking system comes into an effective use. After the occurrence of accident, many victims lost their lives because of failure of emergency treatment, this might be due to without passing proper information to a authorized people in a proper time. This can be avoided with the help of Geo-Tagging system.

2. System Overview

2.1. ADD System

The density of vehicles on our roads rapidly increasing day by day. This forced almost all this vehicle manufactures to think about the extra safety derived in all road conditions. You must have come across this irritating situation while driving at night when you find the headlight lamps focus from an opposite vehicle falling straight in your eyes, making things difficult to assess, giving rise to a situation of a collision or some kind of possible accident. So naturally to get rid of this problem, an automatic mechanism has to come up to dip and dim the headlamp automatically whenever required.



Block Diagram of ADD System

The circuit described here can be built and used in your vehicle for an automatic dipping and dimming operation of the headlamps, in response to the intense lights coming from an opposite vehicle headlamps. The arduino UNO is used as a comparator, which compares the preset resistance level and the LDR resistance level with reference to ground. When light falling over the LDR from the headlight of the vehicle coming from the front, then the arduino triggers the ULN2003IC. This driver IC activates the relay, which in turn flips the contacts such that the host vehicle's headlamp gets connected with the low beam filament. As the opposite vehicle crosses the host vehicle, the headlamps gets connected back to high beam filament. This method simple yet effective automatic control of vehicle headlamps can be achieved.

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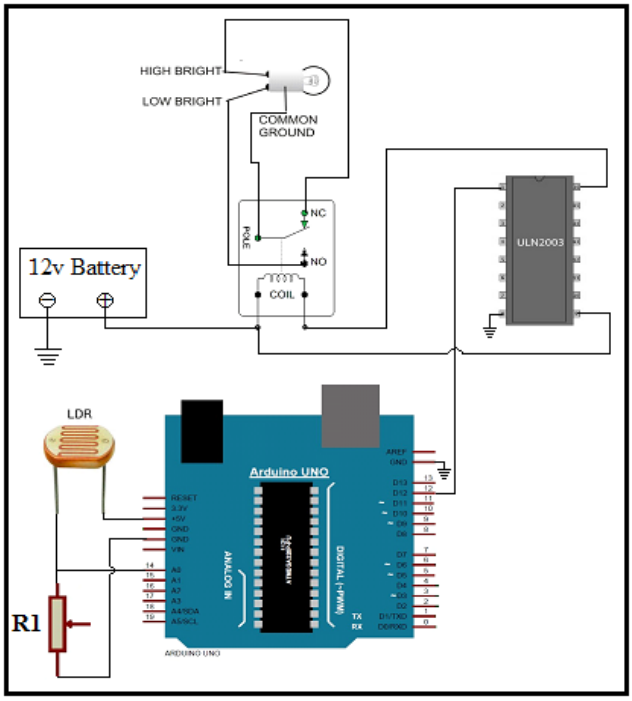


Circuit Diagram of ADD System

2.2. Smart Braking and Speed Control

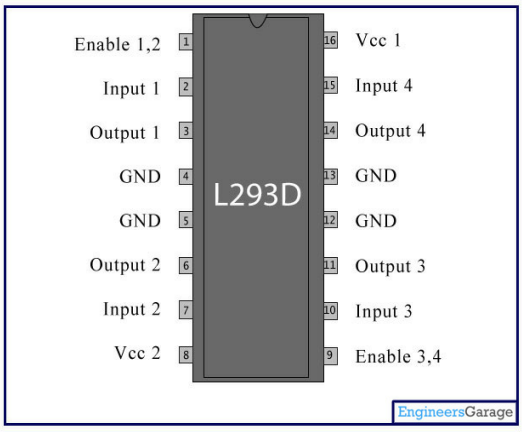
Every year many people lose their lives in accidents due to vehicles. One of the factor is due to inability of the driver to control the vehicle in an emergency situation. The purpose of this feature is to provide smart breaking and speed control. This system is designed using arduino microcontroller to control and provide the feedback to other hardware device.

The main component of this project is the ultrasonic sensor and microcontroller. Output of the sensor is the distance between the vehicle or an obstacle which is in the form of PWM. The sensor gives a pulse for every increase in the distance. The arduino follows the program and gives the necessary output to the control of the driver circuit.

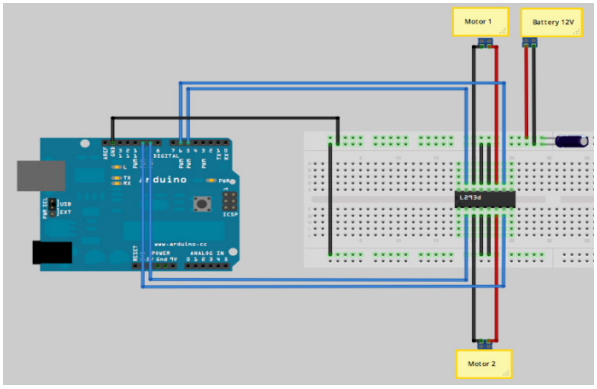
IC L293D: It is a dual H-Bridge motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors.

L293D contains two inbuilt H-bridge driver circuits. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse direction. The motor operations of two motors can be controlled by input logic at pins 2 & 7 and 10 & 15. Input logic 00 or 11 will stop the corresponding motor. Logic 01 and 10 will rotate it in clockwise and anticlockwise directions, respectively.

Enable pins 1 and 9 (corresponding to the two motors) must be high for motors to start operating. When an enable input is high, the associated driver gets enabled. As a result, the outputs become active and work in phase with their inputs. Similarly, when the enable input is low, that driver is disabled, and their outputs are off and in the high-impedance state.



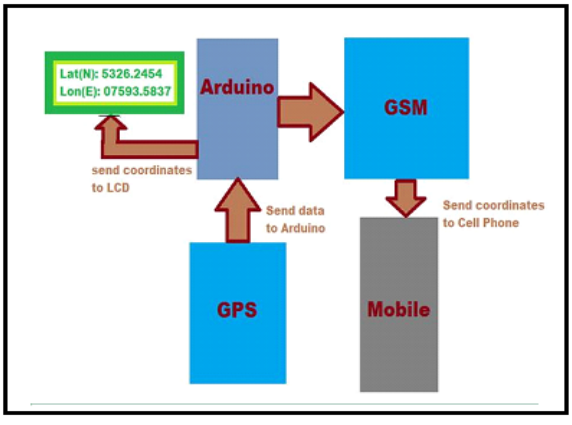
Pin Diagram of IC L293D



Circuit Diagram for Smart braking

2.3. Geo-Tagging

The GPS receiver gets a signal from each GPS satellite. The satellites transmit the exact time the signals are sent. By subtracting the time the signal was transmitted from the time it was received, the GPS can tell how far it is from each satellite. The GPS receiver also knows the exact position in the sky of the satellites, at the moment they sent their signals. So given the travel time of the GPS signals from three satellites and their exact position in the sky, the GPS receiver can determine your position in three dimensions - east, north and altitude.



Block Diagram of Geo-Tagging system

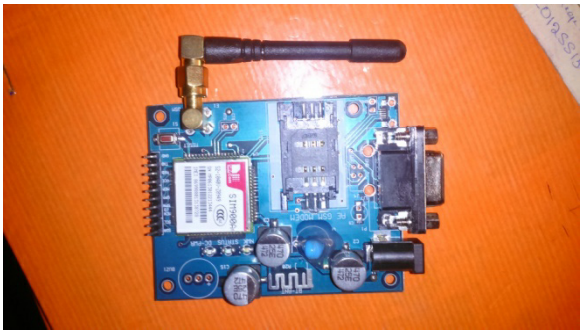
When people talk about "a GPS," they usually mean a GPS receiver. The Global Positioning System (GPS) is actually a constellation of 27 Earth-orbiting satellites (24 in operation and three extras in case one fails). The U.S. military developed and implemented this satellite network as a military navigation system, but soon opened it up to everybody else.

Each of these 3,000- to 4,000-pound solar-powered satellites circles the globe at about 12,000 miles (19,300 km), making two complete rotations every day. The orbits are arranged so that at any time, anywhere on Earth, there are at least four satellites "visible" in the sky.

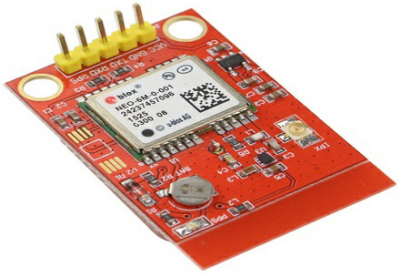
A GPS receiver's job is to locate four or more of these satellites, figure out the distanc-e to each, and use this information to deduce its own location. This operation is based on a simple mathematical principle called trilateration. Trilateration in three-dimensional space can be a little tricky, so we'll start with an explanation of simple two-dimensional trilateration.

Here in our application of GEO TAGGING we use the GPS receiver to track the location of the vehicles position .As soon as the vehicle meets with an accident the signal from the GPS receiver i.e. the location of the accident spot which is computed in the Arduino and converted into text and sent to the various phone numbers fed in the GSM module.

The accuracy of the position your GPS reports is influenced by a number of factors, such as the positions of the satellites in the sky, atmospheric effects, satellite clock errors and ephemeris errors etc.



GPS Module

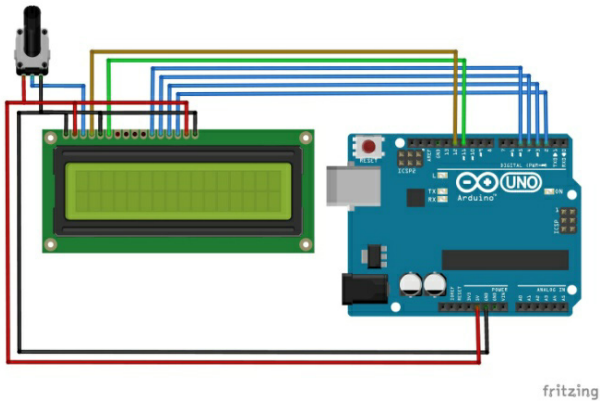


GSM Module

GSM/GPRS module is used to establish communication between a computer and a GSM-GPRS system. Global System for Mobile communication (GSM) is an architecture used for mobile communication in most of the countries. Global Packet Radio Service (GPRS) is an extension of GSM that enables higher data transmission rate. GSM/GPRS module consists of a GSM/GPRS modem assembled together with power supply circuit and communication interfaces (like RS-232, USB, etc) for computer. GSM/GPRS MODEM is a class of wireless MODEM devices that are designed for communication of a computer with the GSM and GPRS network. It requires a SIM (Subscriber Identity Module) card just like mobile phones to activate communication with the network. Also they have IMEI (International Mobile Equipment Identity) number similar to mobile phones for their identification. A GSM/GPRS MODEM can perform the following operations:

1. Receive, send or delete SMS messages in a SIM.
2. Read, add, search phonebook entries of the SIM.
3. Make, Receive, or reject a voice call.

In our project we are concentrating only on the SMS output from the GSM module to the already fed phone numbers. When the vehicle meets with an accident the location is tracked and it has to be sent to the people of concern, Here GSM module is used for the communication purpose. It receives the command from the Arduino along with the text which has to be transmitted over the communication channel for the assistance of accident victim.



LCD Interfacing

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome. LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and 7-segment displays, as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

We particularly use the LCD display to display the status of the ongoing process.

3. Conclusions

The superlative vehicle system developed can be implemented in the existing as well as emerging vehicles. The rate of accidents can be reduced by this system. Night driving is comparatively more preferred by using ADD system. Driver's comfort is considerably improved. The speed control is very efficient by the use of ultrasonic sensor. The impact of Geo tagging in pour proposed project will enhance the reliability of the automobile system. It successfully reduces the number of deaths due to late attendance of the victims by sending the location to the authorized people.

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REFERENCES

[1] Robert. L. Boylestad and Louis Nashelsky "Electronics devices and circuiheory", Robert. L. Boylestad and Louis Nashelsky, PHI/Pearson Education 9th edition.

[2] www.arduino.cc

[3] www.wikipedia.com

[4] www.datasheets4u.com

[5] www.electronicsforyou.com