Self-Regulating Vehicle Slowdown Mechanism for Accident Avoidance

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Abstract : The project is aimed at reducing the speed of the vehicle by sensing the areas / zones which are vulnerable or accident-prone like "School Zone", "Work zone", etc,. This system will sense such zones and accordingly inform the driver and also assist him in controlling the vehicle. In convention, these special zones or areas are indicated at the roadside on a pillar or road sign poles. As an example, near school zone, the sign board displays "School Zone Ahead, Drive Slowly". Drivers go at very high speed as usual near school zone, or operate the harsh driving causing accident, making concept of displaying warning sign and messages on the roadside boards helpless. To provide a better alternative to the conventional display sign, the project includes units: Zone / Area Unit and Vehicle Unit, which will sense such zones automatically and self-governing mechanism accordingly inform the driver and also assist him in controlling the vehicle voluntarily or forcibly. As a result, it is a very effective and fail-proof system to provide traffic regulation, safety and convenience of the people. As the whole project is not just limited for these few functions, this project can be made mandatory, In that way one can provide a more reliable security device and streamline traffic flow.

Keywords: Self-governance, Machine learning.

I.   INTRODUCTION

Our research motivations come from the interest in enhancing the driving facilities and automobile sector in particular. While we are driving on a day to day basis we care about traffic and safe journey. Therefore, it is becoming essential to engage technologies in the driving and automotive systems, in order to have a safer and convenient environment for everyone to drive in. The growing population, accompanied by the increasing prevalence of accidents and rash-driving, will have profound implications for the safety and lives at stake. Therefore, we are proposing a system which enables continuous monitoring for the vehicle over-speeding and rash-driving, thus preventing accidents and other related hazards in vehicles and transport sector that burden the systems and costs. This project presents a framework which utilizes intra-communication between units(i.e., zones and vehicle etc.) in real-time. Technologies are efficient in providing drivers and passengers safety and security anywhere in real-time. Providing such a system that will efficiently monitor the speed levels accurately and efficiently. Especially, in the case of vulnerable areas like schools and hospitals etc. who are much prone to accidents and injuries. It is an utmost necessity to develop new methods and technologies so as to enhance mobility systems for people at a reasonable price with simple use while ensuring maximum

comfort and independence. The goal was to reduce the ill effects of over speeding and provide safety.

II. LITERATURE REVIEW

Literature review was carried out for the whole project to gain knowledge and to improve the skills needed to complete this project. The main sources for this project are previous project on the same basis, research thesis, books, journals and online tutorials. This chapter mainly focuses on the basic concepts and all fundamental theories which are related to this project and the drawbacks of the current system.

III. EXISTING SYSTEM

In existing, drivers require visual assistance for reducing their vehicle speed and deceleration. There were many technological developments implemented for automobiles. But most of them fail due to negligence and instant commute. Therefore the boards and other zone-specific speed levels are violated.

IV. PROPOSED SYSTEM

Here we propose a remote speed monitoring system for a with low cost and efficiency. We are going to implement, using communication to continuously monitor the speed status of the vehicle and reduce them on real-time using the embedded systems. In our research, we are using a speed sensor connected to Arduino Uno to measure the vehicle's current speed and analyze the results with prescribed limits and take necessary action, if required. This ensures the real time monitoring is done. The reduction in speed of the vehicle is given if the speed is more, so the vehicle moves in reduced speed in the given zone to avoid any traffic related incidents
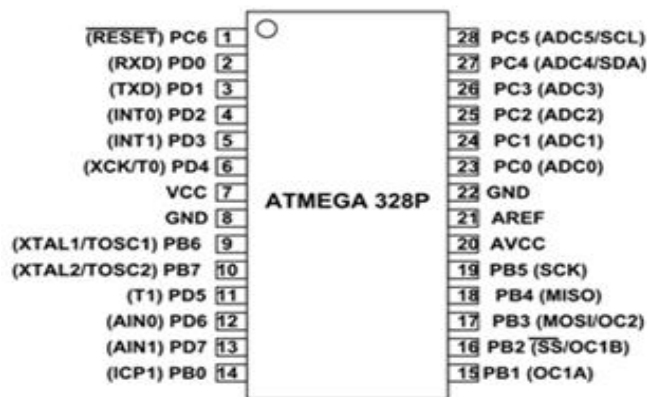
BLOCK DIAGRAM OF THE PROPOSED SYSTEM
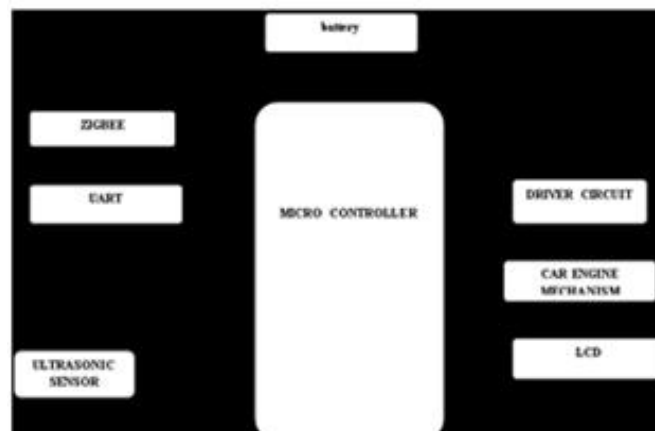
HARDWARE IMPLEMENTATION AND RESULTS DISCUSSIONS

Implementation of our project is done with Arduino. Our major components are:
1. ARDUINO UNO

Arduino Uno may be a microcontroller board supported the ATmega328P. It has 14 digital input/output pins (of which 6 are often used as PWM outputs), 6 analog inputs, a 16 MHz quartz , a USB connection, an influence jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller, simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to urge started. You can tinker together with your UNO without fear an excessive amount of about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again. ATMEGA328P is a 28 pin chip many pins of the chip here have more than one function

2. ZIGBEE MODULE

ZigBee is an IEEE 802.15.4-based specification for a suite of high-level communication protocols used for wireless networking. It is a wireless technology developed as an open global standard to address the unique needs of low-cost, low-power wireless M2M networks. ZigBee (CC2500) is a low cost true single chip 2.4 GHz transceiver designed for very low power wireless applications. The RF transceiver is integrated with a highly configurable baseband modem. The ZigBee specification is intended to be simpler and less expensive than other wireless personal area networks (WPANs), such as Bluetooth or Wi-Fi. Its low power consumption limits transmission distances to 10-100 meters line-ofsight, depending on power output and environmental characteristics

3. MOTOR

Geared dc motors can be defined as an extension of dc motors. A geared DC Motor has a gear assembly attached to the motor. The speed of motor is counted in terms of rotations of the shaft per minute and is termed as RPM .The gear assembly helps in increasing the torque and reducing the speed. Using the correct combination of gears in a gear motor, its speed can be reduced to any desirable figure. This concept where gears reduce the speed of the vehicle but increase its torque is known as gear reduction. A DC motor can be used at a voltage lower than the rated voltage. But, below 1000 rpm, the speed becomes unstable, and the motor will not run smoothly.
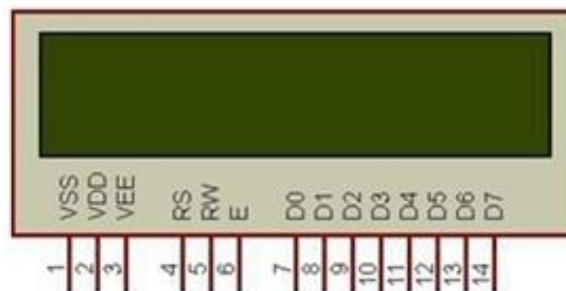
4. LCD DISPLAY

The most commonly used Character based LCDs are supported Hitachi's HD44780 controller or other which are compatible with HD44580 Most LCDs with 1 controller has 14 Pins and LCDs with 2 controller has 16 Pins (two pins are extra in both for back-light LED connections). LCD, or Liquid Crystal Display, is the fundamental display technology. They are thinner and lighter and draw much less power than cathode ray tubes. Mostly LCD Work on the principle of blocking light rather than emitting it.Only the instruction register (IR) and the data register (DR) of the LCD can be controlled by the MCU The internal operation of the LCD is determined by signals sent from the MCU The signals are register selection signal (RS), read/write signal (R/W), and the data bus (DB0 to DB7)

5. ULTRASONIC SENSOR

Ultrasonic transmitter emitted an ultrasonic wave in one direction and started timing when it launched. Ultrasonic spread in the air and would return immediately when it encountered obstacles on the way. At last the ultrasonic receiver would stop timing when it receives the reflected wave. The distance of sensor from the target object is calculated. It offers excellent non-contact range detection with high accuracy and stable readings in an easy-to-use package. It operation is not affected by sunlight or black material. The supply voltage to the sensor is 5VDC. The sensor has two pins namely trig and echo which is connected to the controller to give digital input.

V.   SETTING OF SOFTWARE

A PHP means Hypertext Pre-processor (PHP) is a programming language that allows web developers to create a dynamic web page .login from which requires admin name and password. In this project we are using Adobe dream weaver software for generating the website. Adobe dream weaver may be a proprietary web development tool and it's a neighbourhood of cloud. Adobe dream weaver is the all-in-one visual development tool for creating, publishing and managing the websites The php code has two module one is view buses and another one is logout. When we will click view buses it will show all bus images .logout option is used to exit from the admin web-page. Each bus have separate hardware sample for automatic bus ticketing. Wi-Fi The adapter receives signals from a wireless router or other wireless devices and it translates the signal, therefore

the person can access the web at any time they are in range of a Wi-Fi hot-spot or wireless network. PHP provides mysql connect function to open a database connection .The passenger and bus details have to be maintained by mysql database all the details will be updated automatically by using network

VI.   CONCLUSION

In this paper, we have developed a mechanism using Li-Fi communication systems to overcome the problem of over-speeding. The above mechanism represents the working and how the module will work in current application in monitoring of vehicle speed within the speed limits without any manual assistance. In this we are implemented a technology like Self-regulating mechanism. In this mechanism when a vehicle accelerates above prescribed range then the automatically the vehicle will slowdown in the given zone and ensure safety and maximum comfort in roads. Also we can in future be using IOT app to know the exact details of vehicles for any further action. This will help to know about the real time status of the vehicle on the roads and highways.

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