

TRAFFIC VIOLATION DETECTION SYSTEM

Traffic Enforcement System

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Abstract— the proposal framework gives a continuous information discovery and warning instrument to identify traffic violations, additionally to advise the police and the vehicle owner of the submitted infringement so as to take the right procedure at the perfect time, resulting in an increasing rate of saved lives. The framework includes some techniques to recognize whether the driver is drunk or not. Then it measures the speed of vehicle, if vehicle is in over speed then shutdown flag is send to the vehicle then vehicle gets back off and ceased. There are a few mechanisms to check the vehicle parameters and archives (Vehicle Reg. no, Seat belt status, liquor status, protection, charge and so forth.) status on the off chance that anything find disgraceful then the auto gets captured and ceased. Utilizing RFID innovation, can distinguish the Theft vehicle when a vehicle get burglary.

Index Terms— GSM, Liquor sensor, PIC (18F45K22) microcontroller, RFID, SMS.

I. INTRODUCTION

The number of private as well as public vehicles is increasing with a large rate. This increase in number of vehicles is serving a reason for increase in traffic rule violation and various crimes associated with it. Traffic rule violation is leads to various road accidents. Statistics show that traffic violations are the most important cause of the accidents. Street mischance is most undesirable thing to happen to a street client, however they happen frequently. The most deplorable thing is that we don't gain from our errors on street. The majority of the street clients are very much aware of the general tenets and security measures while utilizing streets however it is just the laxity on part of street clients, which cause mishaps and accidents. Different instances of burglary, attempt at manslaughter, theft, hijacking, carrying, on-street fatalities, and so forth stay unsolved on the grounds that the vehicles included couldn't be perceived precisely. Manual checking of vehicles is troublesome and mistake inclined due to feeble and problematic human memory. Consequently, there is a need of a powerful instrument, for example, a computerized vehicle acknowledgment framework to deal with this errand. Petty criminal offense recognition frameworks are successful instruments to help movement organization to screen the activity condition. It can identify criminal traffic offenses, for example, running red lights, speeding, and vehicle retrogress in genuine time. Traffic administration postures numerous basic difficulties in most present day urban areas, including clog, petty criminal offenses, auto burglary, and illicit vehicles. Such Traffic laws were established to oversee activity likewise direct vehicles, and to encourage the efficient and convenient stream of vehicles. These days' movement police confronting numerous challenges to identify the vehicles that violets activity rules. More than one officer is required for activity checking. Still large portions of the culprits are effortlessly gotten away from the police. Infrequently got away vehicles are pursued by the cops and it will prompts to mishaps. Be that as it may, in the meantime many individuals offer regard to activity guidelines and they accurately comply with that standards. Such individuals are essentially squandering their time. When considering such sort of framework there ought to be a one of a kind distinguishing proof of vehicles. The fundamental technique utilized for vehicle distinguishing proof is video based number plate acknowledgment. The essential disservice of this approach is its reliance on climate conditions and tags status. In the event that tags are muddied or in the event that it is overwhelming down-pouring or snowing such identification turns out to be for all intents and purposes unthinkable. Violator driving style can likewise keep the identification. For example, a few frameworks come up short when the driver much of the time changes his driving paths close to the cameras or in a split second lulls. The most ideal approach to manage this weakness is to join an extra identification source to the vehicle. The greater part of the lethal mishaps happens due to over speeding. It is a characteristic mind of people to exceed expectations. Quicker vehicles are more inclined to mishap than the slower one and the seriousness of mischance will likewise be more if there should arise an occurrence of speedier. Higher the speed, more prominent the hazard is. At fast the vehicle needs more prominent separation to stop i.e. braking separation. A vehicle proceeding onward rapid will have more noteworthy effect amid the crash and consequently will bring about more wounds. The capacity to judge the inevitable occasions additionally gets decreased while driving at quicker speed which causes blunder in judgment lastly a crash. To take care of the real issue of over speeding, a few strategies have been received yet the majority of them is to a great extent insufficient or physically worked and relies on upon the client's capacity to be ready when utilizing them. Accordingly, a programmed speed caution and revealing framework is required which can illuminate a driver as far as possible and in addition his/her speed restrain and furthermore alarm him/her on the off chance that he/she surpasses the utmost.

It is a traffic management system that combines RFID and GSM technologies. RFID technology which provide a reliable data reading without the need for line-of-sight that other data detecting technologies depend on. While GSM is an open digital cellular technology that used for the notification process. Using RFID technology identify the vehicle uniquely and then compare details of document with data stored in the database. In that there is any violation; stop alert is given to the vehicle through GSM technology and also alert given to police by that device.

II. RELATED WORKS

A. Vehicle number plate detection system

Number plate acknowledgment is a successful route for programmed vehicle distinguishing proof. Vehicle Number Plate Detection (VNPD) is a mass surveillance framework that catches the picture of vehicles and perceives their permit number. Vehicle Number Plate Detection (VNPD) framework is a kind of canny transportation framework (ITS).Some of the current calculations in light of the rule of learning takes a ton of time and ability before conveying tasteful outcomes however and still, after all that needs in precision. In the proposed

framework an effective technique for acknowledgment for Indian vehicle number plates has been advised. The calculation goes for tending to the issues of scaling and acknowledgment of position of characters with a decent exactness. The goal is to outline a productive programmed approved vehicle ID framework by utilizing the Indian vehicle number plate to such an extent that the number plate of vehicle can be recognized precisely and to execute it for different applications, for example, programmed toll charge accumulation, stopping framework, Border intersections, Traffic control, stolen autos and so on. As we have seen the fundamental technique utilized for vehicle distinguishing proof is video based number plate acknowledgment. The essential impediment of this approach is its reliance on climate conditions and tags status. In the event that tags are muddied or in the event that it is overwhelming drizzling or snowing such identification turns out to be for all intents and purposes unthinkable. Violator driving style can likewise keep the identification. For example, a few frameworks fall flat when the driver much of the time changes his driving paths close to the cameras or in a flash log jams.

B. Red Light Violation Detection System

Red Light Violation Detection System is a mass surveillance system that automatically captures the Image of vehicle violating the traffic rules. RLVD system automatically captures images of vehicle from backside with license plate numbers and performs OCR (optical character recognition) on images to read the license plates on vehicles. RLVD continuously monitors the traffic signal, and camera is itself triggered by any vehicle passing over the sensors at specified time after signal has turned red. Alerts are typically sent by mail or SMS to the owners of violating vehicles, based on review of photographic evidence. RLVD can be used for following purposes such as Automatic vehicle identification system, Vehicle surveillance - vehicle and speed checks, stolen vehicle detection, Monitoring known offenders, criminals, Border patrol / enforcement, Cargo container logistic management system.

III. FEATURES OF TRAFFIC ENFORCEMENT SYSTEM

- The proposed traffic management system provides a real-time data detection and notification mechanism to detect traffic speed violation, also to notify the police and the car owner of the committed violation.
- This system also used to identify whether the driver is alcoholic, or not, by using this system the police doesn't need to chase down the law breakers.
- This system also used to ensure the passengers are wearing seat belt.
- This system send a check signal to the vehicle which check the vehicle parameters and document (Vehicle Reg. no, insurance, tax, pollution etc.) status if anything find improper then the car gets arrested.
- This system can be used to detect the Theft cars when a car get theft that car details is passed to device then whenever device detects the details of that car the car can be arrested.

IV. IMPLEMENTATION

The system comprises of two modules such as vehicle and enforcer. Enforcer module is for police officers. Details about violations in the traffic are displayed in the enforcer module. And also this unit contains alerts system, level shifter and storage for saving the details. Whenever a vehicle approaches the range of the enforcer the speed of vehicle is measured and checked if vehicle is in over speed then shutdown signal is send to the vehicle end then vehicle gets slow down and stopped and if vehicle is going in normal speed then enforcer send a check signal which check the vehicle parameters and document status if anything find improper then the vehicle gets arrested and stopped.

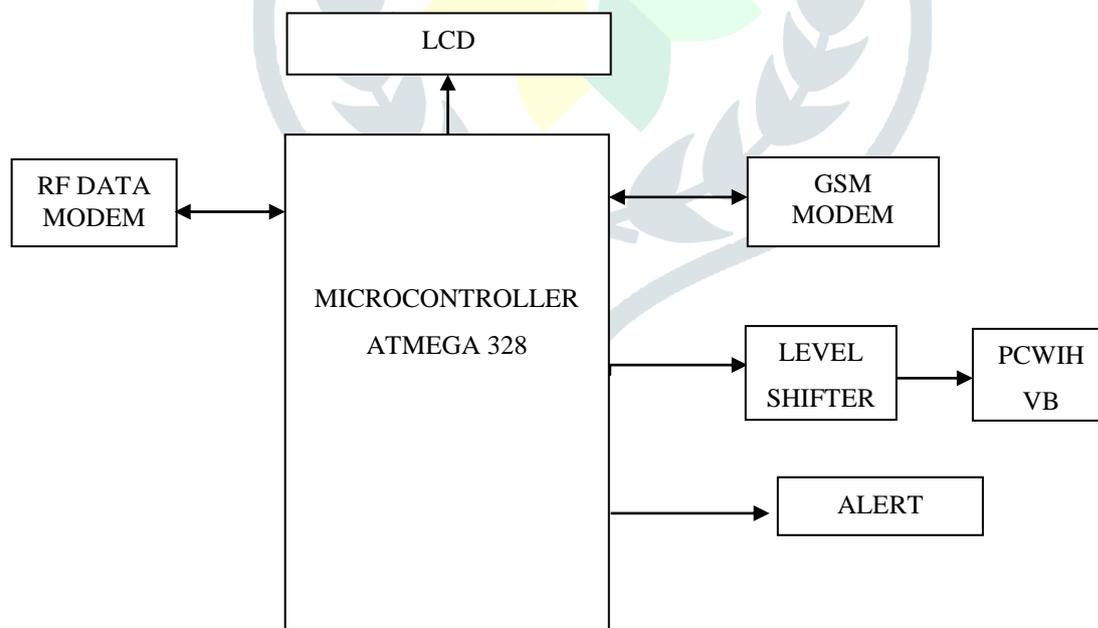


Fig1: Block diagram-Enforcer unit

Microcontroller: The high-performance Atmel 8-bit AVR RISC-based microcontroller combines 32 KB ISP flash memory with read-while-write capabilities, 1 KB EEPROM, 2 KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operates between 1.8-5.5 volts. By executing powerful instructions in a single clock cycle, the device achieves throughputs approaching 1 MIPS per MHz, balancing power consumption and processing speed.

RF BIT Transmitter Receiver: The RF module, as the name suggests, operates at Radio Frequency. The corresponding frequency range varies between 30 kHz & 300 GHz. In this RF system, the digital data is represented as variations in the amplitude of carrier wave. This kind of modulation is known as Amplitude Shift Keying (ASK). Transmission through RF is better than IR (infrared) because of many reasons. Firstly, signals through RF can travel through larger distances making it suitable for long range applications. Also, while IR mostly operates in line-of-sight mode, RF signals can travel even when there is an obstruction between transmitter & receiver. Next, RF transmission is more strong and reliable than IR transmission. RF communication uses a specific frequency unlike IR signals which are affected by other IR emitting sources.

GSM modem: A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network. , many of them can be used for sending and receiving SMS and MMS messages. A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection, or it can be a mobile phone that provides GSM modem capabilities.

Next module of the system is vehicle. Vehicle consists of different sensors such as alcoholic sensor, alcohol sensor, seatbelt status checker as well as an alert system to alert the Vehicle owner. The vehicle part also includes a display. It also includes a speed controller and level shifter in order to slow down and stop the vehicle when getting an alert.

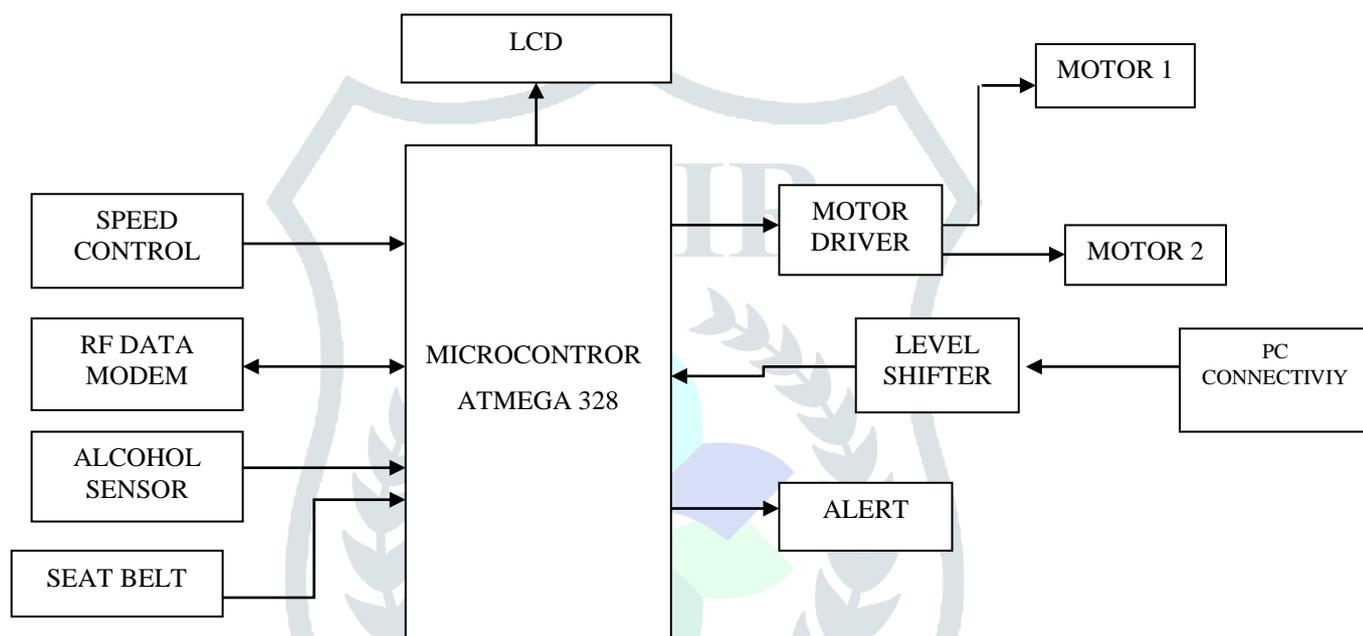


Fig 2: Block diagram-Vehicle unit

Motor Driver: L293D 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.

LCD: LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

Level Shifter: The MAX232 IC is used to convert the TTL/CMOS logic levels to RS232 logic levels during serial communication of microcontrollers with PC. The controller operates at TTL logic level (0-5V) whereas the serial communication in PC works on RS232 standards (-25 V to + 25V). This makes it difficult to establish a direct link between them to communicate with each other.

The intermediate link is provided through MAX232. It is a dual driver/receiver that includes a capacitive voltage generator to supply RS232 voltage levels from a single 5V supply. Each receiver converts RS232 inputs to 5V TTL/CMOS levels. These receivers (R₁ & R₂) can accept ±30V inputs. The drivers (T₁ & T₂), also called transmitters, convert the TTL/CMOS input level into RS232 level.

Buzzer: A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.

IR Sensor: IR Sensors work by using a specific light sensor to detect a select light wavelength in the Infra-Red (IR) spectrum. By using an LED which produces light at the same wavelength as what the sensor is looking for, you can look at the intensity of the received light. When an object is close to the sensor, the light from the LED bounces off the object and into the light sensor. This results in a large jump in the intensity, which we already know can be detected using a threshold.

Relay: A relay is an electrically operated switch. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. Relays with calibrated operating characteristics and sometimes multiple operating coils are used to protect electrical circuits from overload or faults.

Air quality sensor: Air quality sensor is for detecting a wide range of gases, including NH₃, NO_x, alcohol, benzene, smoke and CO₂. Ideal for use in office or factory. MQ135 gas sensor has high sensitivity to Ammonia, Sulfide and Benzene steam, also sensitive to smoke and other harmful gases. It is with low cost and particularly suitable for Air quality monitoring.

V. CONCLUSION

An intelligent traffic management system is proposed in this paper. It overcomes most of the disadvantages of existing systems and consequently, it provides low cost, low power consumption and low maintenance. Furthermore, it can operate in harsh environments. The proposed work considers not only the priority of the vehicles but also the density of the vehicles on the road and controls the traffic light sequence efficiently and more accurately and the accuracy of the RFID is more than Camera's so it also improves the performance of traffic light Violation Detection System. The system can track vehicles effectively, and automatically save and display the information. It realizes intelligent traffic management. It enables a more fast and accurate detection and tracking. The system is a unified platform for traffic violation management.

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