

Ground Vehicles Traffic Rules Adversity Detection and Control for Indian Roadways

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ABSTRACT: Smart Cities administrations ranges from open well being and movement administration to canny road lighting . The principle point is to accomplish zero disappointment foundation for the general public. The World Health Organization's (WHO) give an account of Road Safety (2013) states that the assessed GDP misfortune because of street car accidents is around 3% for India. Attributable to dangerous condition on streets, the rate of mishaps in India has been high. As indicated by WHO insights for 2012, out of around 11.8 lakh street disaster passing over the world, 84,674 passing's were accounted for from India alone. In the year 2014, the quantity of street mischance passing's in India expanded to 92,618. Considering the gravity of the conditions, there is accord that deliberate measures are vital for lessening this abnormal state of mischance passing's and wounds through enhanced security measures and movement administration. The proposed framework has been intended to beat the weakness in the movement administration. The framework gives data about street blockage, capacity to control the stream of activity and furthermore practice crisis exit for crisis vehicle. Interfacing of Internet with the genuine existing movement instrument additional items the capacity of the proposed framework to lessen human intercession and increment the nature of activity administration.

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I. Introduction

Traffic congestion leads to long and unpredictable commute times, environmental pollution and fuel wastage. These negative effects are more acute in developing countries like India, where infrastructure growth is slow because of cost and bureaucratic issues. Frustration with the traffic lights results in an increase in accidents from cars moving when the traffic light, signals them to stop.

Intelligent traffic management and better access to traffic information for commuters can help alleviate congestion issues to a certain extent. The traffic lights ensure that vehicles from every direction get a chance to proceed through the intersection in an orderly fashion. Normally, we will have the traffic signal lights programmed for particular time intervals. But, in day-to-day life we observe that traffic on one side on a two-way road is predominantly more when compared to the other. In such a situation programming equal intervals of time for both types of traffics, attributes to congestion during hours of heavy traffic, making traffic delays. But, here we propose a system that generates the traffic light signals based on the vehicle density, contrary to the old method of allotting the same time intervals to all roads irrespective of their traffic density. This type of traffic light signaling system is nowadays used in all the metropolitans. In this method to monitor traffic, the density of traffic is measured by various sensors; these sensors are placed on either sides of the road.

The sensors output is given to a microcontroller so that it will take action accordingly. In the past few years, traffic accidents & congestions have increased enormously. Though the vehicle volume has increased exponentially, the road infrastructure has not been improved proportionately. This in turn leads to increased traffic congestion and road accidents.

Different technologies are there to detect traffic congestion and to make congestion management more efficient, but these technologies have several drawbacks, such as installation problems, complexity, cost, etc. In an attempt to reduce the problems related to traffic & improve the traffic discipline, advanced technological solutions have been proposed in this paper.

Through this project we are aiming to provide a system, which will continuously monitor the vehicles using wireless energy signal transmitters and receivers and automatically incur penalty for violation of any of the traffic rules. If a driver violates any of the traffic rules, the driver will be charged according to the RTO

II. Literatu Re Review

Road traffic accident is one of the major preventable public health problems and is on rise due to increase in number of vehicles, lifestyle and risky attitude. As per global report 'India has highest number of road accident in the world' as well as 'highest number of death' due to it. Every year about 1,30,000 death are reported due to road accident in India. When compared to developed nation, the number of road traffic accidents in India were three times higher. So we gathered information related to road traffic accident through different sources. The conclusion of research is the burden of road traffic accident was found to be high globally as well as in India. Hence it makes necessary to take approach in its prevention and control.

Another major challenge is traffic rule violation as breaking traffic signals, over speed driving, driving from wrong side etc. In current system traffic police are there on the road and has to check continuously that if someone is violating the rule. The camera also mounted for continuous monitoring. But all these things has limitations like cameras need a person to be present for continuous monitoring and whole stored video had to be checked manually for one particular traffic rule break detection. There are some other problem like drunk and drive cases, driver's drowsiness, vehicle thieving etc. Where system fails to find solution.

In our project we have tried to find the solution for all these problem. To solve the accident problem we use different type of sensors to alert the driver. We use alcohol sensor to detect that either driver is drunk or not. We also use ultrasonic sensor to keep safe distance between two vehicles. One of the important feature in our project is 'license as a key'. So that only owner of vehicle can drives the vehicle who have is license. To reduce the burden of traffic rule break detection, we create a system in which automatically a person loose his balance from bank account who break the traffic rules. So by these ways we tried to find solutions for road vehicle safety.

III. Justification Reserch

Firstly , in this research we are concatenating sensors for human safety .ultrasonic sensor for accident prevention and alcohol sensor for drunk detection. Secondly, we use an EM-18 Redder for licence as key , in this include RFID tag .Licence code display on which Licence the vehicle is running . And thirdly in this research design signal pole and zebra crossing road for traffic rule break detection.

IV. Proposed Approach

This papers aims to incorporate four main purposes.1)Accident Detection 2)Drunk Detection 3)Licence as a key 4)Traffic Rule Break Detection. Thus by incorporating all of this features on to a signal system . now a days , increasing number of vehicles . This cause increasing traffic problem and accident problem .People may lose their valuable life . In our India people does not follow the traffic rule .Most of the time accident on road because of obstacles as well as driver drunk .when accidents happens that time vehicle owner face to problem of inquiry . we aim to create Ground Vehicles Traffic Rules Adversity Detection and Control For Indian Roadways.

Fig (a) Block Diagram

- Accident Prevention /detection/alarm: Here ultrasonic sensor used for accident detection .When the IR transmitter emits IR rays ,it hits to obstacles they are received by IR receiver.IR receiver on the vehicle receives the IR radiations and obstacle will be present front of the vehicle that time sensor will be alert through alarms and message will be display on LCD and also message will be sent vehicle of the owner as well as R.T.O. office through the GSM.



Image1 Message display on LCD as well as owner of vehicle



image2 Ultrasonic sensor placed on vehicle

- **Driver Drunk Detection:** Here Alcohol sensor used for drunk detection . This sensor front of driver .Alcohol sensor detects the attentiveness of alcohol gas in the air and an analog voltage is an output reading . The sensor can activate at temperatures ranging from -10 to 50°C If driver will have drunk that time display the message LCD and this message will be sent vehicle of the owner as well as R.T.O. office through the GSM



Image 3 Alcohol sensor placed on vehicle



Image4 Message display on LCD as well as vehicle of the owner

- **Licence as a key:** In this feature used Em 18- Redder module and RFID card .Here RFID card use as licence . Em 18 –Redder ia a great little RFID Reader Module. Just power the module, it will read any RFID card within range. The RFID (Radio Frequency Identification-125KHz RFID system) essentially consists of an RFID Reader/Writer (Transceiver), an HF Tag and a Processor unit interfacing to various peripherals..First swipe the RFID card on EM-18 module .Module read the card .Licence code display on which licence the vehicle is running .It will be sent the message holding of the vehicle as well as R.T.O. office .When accidents happens that time inquiry on which licence the vehicle is a running

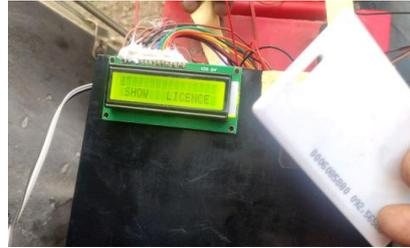


Image 5 message display on LCD “SHOW LICENCE”



Image 6 EM-18 Reader Module Read the code on licence



Image 7: message display on LCD as well as on which licence vehicle is running

- **Traffic Rule Break Detection:** Here copper coils are used for traffic rule break detection. We have designed traffic signal pole using pipe and blub and zebra crossing road using wooden board.

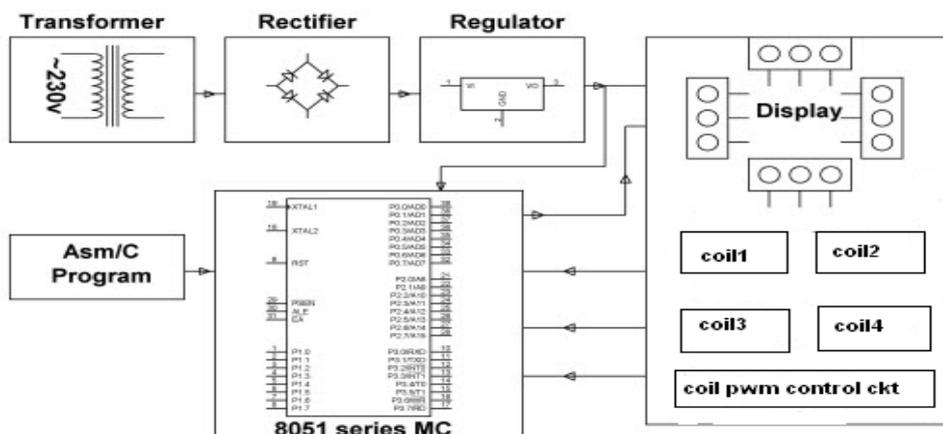


Fig 2: block diagram of signal side

In the above circuit diagram of traffic light controller, a Copper coils is used, and three bulbs are used for the purpose of traffic light control. An 8051 Microcontroller is the brain of this whole project and is used to initiate the traffic signal at the intersections on road. This circuit diagram makes use of a crystal oscillator for generating frequency clock pulses. The bulb are interfaced to the Port zero of the microcontroller and are powered with 5v power supply..

The bulbs get automatically switched on and off by making the corresponding port pins of the microcontroller high, based on the 8051 microcontroller and its programming done by using KEIL software. At a particular period of time, only the green light holds ON and the other lights remains OFF, and after sometime, the changeover traffic light control from green to red takes place. This process continues as a cycle and the timing for changing the bulbs can be displayed with the use of a seven-segment bulb display. When any side of the signal is red that side coil is also energises or activated. For green transmitting copper coil on zebra crossing will be deactivate. If any of vehicles crosses zebra crossing when signal is red and copper coil is active then it will activate secondary coil placed in vehicle and signal break indication is given.

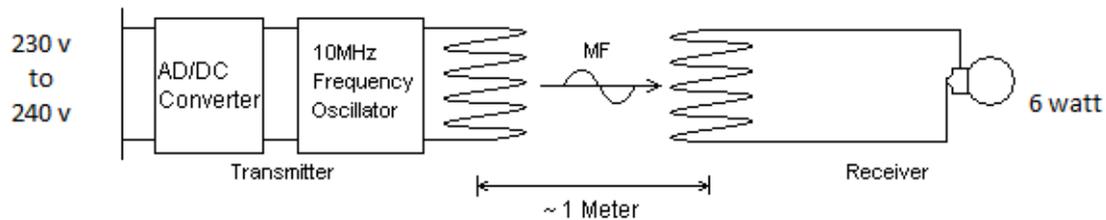


Fig 3 : Wireless Energy Charger

Transmitter section :

The source of DC voltage supplies the DC voltage at input of DC/AC Inverter, which is given with relay used to make or break the connection. Then the AC voltage is given to the split transformer which splits the voltage & provide the voltage as our requirement, the splitting of voltage depends on the ratio of transformer then the voltage is given to transmitting inductor(Tesla coil) & the voltage flow through this coil is in the form of electromagnetic waves which is then transmitted towards receiving inductor.

Receiver section :

The receiving inductor (Copper coil) is used to receive the electromagnetic waves which produces the voltage inside the coil which is in AC form .This voltage passed through rectifier & filter circuitry which converts the AC voltage in DC form & removes the unwanted contents using filter. This circuit used to provide smooth DC voltage. The received voltage may be in unregulated form which must be regulated using Voltage regulator so at the output we get regulated DC voltage.

This receiver section is connected in vehicle black box. So if transmitter coil is active means red signal at that time if user crosses zebra lines the receiving coil will be energies and signal break is detected.

The wireless energy charger is composed of two independent parts: the transmitter and the receiver which are linked together by a magnetic field.

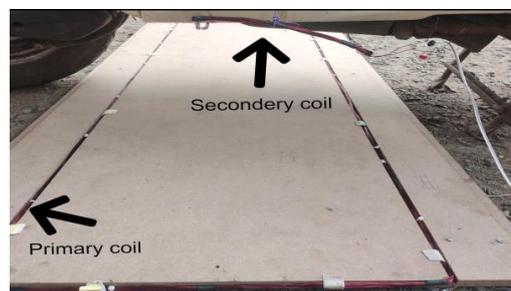


Image 8 Primary Coil placed on Zebra crossing and secondary coil placed on below the chassis of vehicle



Image 9 message display on LCD as well as Vehicle of the owner



Image 10: Ground Vehicles Traffic Rules Adversity Detection and Control For Indian Roadways

V. Power Supply

The circuit needs two different voltages, +5V & +12V, to work. These dual voltages are supplied by this specially designed power supply. The power supply, unsung hero of every electronic circuit, plays very important role in smooth running of the connected circuit. The main object of this 'power supply' is, as the name itself implies, to deliver the required amount of stabilized and pure power to the circuit. Every typical power supply contains the following sections:

VI. Software Description:

In this paper we have made use of AT89c52 and 8051 microcontroller .. Programming is done in embedded c language. Compiler use keil microversion 4 .The compiler program is download onto the microcontroller

VII. Conclusion

In this paper we conclude that we were able to successful incorporate all the four features mentioned in this paper our model. This will be useful for mankind .Accidents that occur due to human errors can be completely avoided and People can't break the traffic rule.

Application

- 1.This system helps to avoiding the break the traffic rules.
- 2.Human security.
- 3.Avoiding the accident occurrence.
- 4.Effective in highly populated area.

Advantages

- 1The cost of the system will be less.
- 2 simple construction ,mature technology and easy maintenance.
- 3Human security.

4 Avoiding the breaking traffic rules.

Disadvantage

- The only thing that is clear about constitutional protections for location-based service information is the lack of clarity.

Future Scope

1. Using the sensors on the vehicle in case of accident occurrence.
2. Future vehicle will follow the traffic rules.

References

- [1]. "ARM7DI Data Sheet"; Document Number ARM DDI 0027D; Issued: Dec 1994.
- [2]. Sakr, Sharif. "ARM co-founder John Biggs". *Engadget*. Retrieved December 23, 2011. "[...] the ARM7-TDMI was licensed by Texas Instruments and designed into the Nokia 6110, which was the first ARM-powered GSM phone."
- [3]. "D-Link DSL-604+ Wireless ADSL Router - Supportforum - eXpansys Sverige". 090506 expansys.se
- [4]. Andrew (bunnie) Huang. "On MicroSD Problems". Bunnie Studios. "This is comparable to the raw die cost of the controller IC, according to my models; and by making the controllers very smart (the Samsung controller is a 32-bit ARM7TDMI with 128k of code), you get to omit this expensive test step while delivering extra value to customers"
- [5]. ARM Architecture Reference Manual.
- [6]. Electronic Communication Systems – George Kennedy
- [7]. Electronics in Industry - George M.Chute
- [8]. Principles of Electronics - V.K.Mehta
- [9]. www.electronicsforu.com
- [10]. www.howstuffworks.com
- [11]. Telecommunication Switching, Traffic and Networks – J.E.Flood Hanjiang Luo, Kaishun Wu, Zhongwen Guo, Lin Gu, Zhong Yang and Lionel M. N "SID: Ship Intrusion Detection with Wireless Sensor Networks" International Conference on Distributed Computing Systems.
- [12]. ARun sahayadhas, Kenneth Sundaraj , Murugappan. "Detecting Driver Drowsiness based on sensors Review." In Al-rehab research group, University Malaysia Perlis ,Malaysia 2012

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