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ACCIDENT PREVENTING SYSTEM THROUGH VEHICLE TO VEHICLE COMMUNICATION

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Abstract - Number of vehicles is increasing day by day, in recent days,so that, traffic density increases on the road, that results us in slowing the speed, increases in vehicle queuing and at sometimes it leads to meet accidents in overcrowded and invisible areas. Traditional traffic control system is not enough to control the current traffic density, it requires some enhancement to the existing system to avoid the traffic congestion. Proposed work describes Global System for Mobile communication (GSM), Light Fidility (LI-FI) and Blinspot system helps to overcome the congestion on the roads and accidents occuring in the roadside. The density of the vehicles and the interruptions can be obtained by IR sensors. And depending on the density of the vehicles, the speed of the vehicle would be controlled by the motor. The vehicles can also modify the route if the traffic is intense in the current route and information regarding heavy traffic is provided to vehicles move on through the GSM. Blindspot system identifies the vehicle from the nook and corners of the roadsides and intimates the drivers by the communication through LI-FI technology.

Key Words: Vehicle to vehicle communication, GSM, LI-FI, Blindspot system

1. INTRODUCTION

Overtaking on rural roads might cause severe accidents once oncoming traffic is detected by a driver too late, or its speed is Underestimated. This suggested method have the ability to communicate and exchange useful information in order to avoid collisions during overtaking or if any object breaks the continuity of the light signal from one transmitter vehicle to the other receiver vehicle. Here, indication will be provided to the driver through a text message or a buzzer or through an audio signal. By absorbing the light signal from the transmitter, receiver can understand the status of the transmitter vehicle. At the same time we also have to concentrate on the accidents happening at the very remote corners at some particular areas where one side road is invisible to the other side. To avoid these kind of problems, introduced a concept of blindspot monitoring.

2. RELATED WORKS

2.1 Vehicle to Vehicle Communication Using RF and IR Technology

Eftekhar Hossain, Nursadul Mamun, Md. Fahim Faisal [2017] has suggested that, in the urban areas, most of the noise pollution are caused due to crying atmosphere that is made by industrial machineries and vehicle horn. Among all the explanations the vehicle horn is assumed most important for creating the reedy setting that encompasses a risky impact on the human health. Therefore, it is become graver to need a system that is able to make the environment safe and sound. To confront this challenge, this study proposes a V2V or Vehicle to Vehicle Communication System. In this study,the V2V Communication has been accomplished using both Infrared and radio frequency communication without using horn. IR transmitter which is used to transmit the signal to front side vehicles and RF transmitter which is used to transmit the signal to both left and right side vehicles are placed in front of the driver. Moreover, IR and RF receivers ar inserted behind the automobile to receive the corresponding transmitted signal from the opposite vehicles. A speaker is employed to alert the driving force and a digital

display is employed to point out from wherever the transmitted signal has been return and also the driver can decide wherever the car should be moved. The whole functions of the system ar processed by PIC Microcontroller. The goal of this work is to mitigate the vehicle noise to some extent and to scale back inessential vehicle horn. This system will be used as a substitution of horn system within the inhabited, emergency and busy places.

2.2 Vehicle detection through wireless vehicular communication

DimitriosVlastaras, Taimoor Abbas, Daniel Leston and Fredrik Tufvesson [2014] proposed that vehicles within the future are anticipated to own the flexibility to speak and exchange helpful data so as to avoid collisions. However, for this cooperation to be attainable, all vehicles can have to be compelled to be equipped with compatible wireless modules, based on, e.g. IEEE 802.11p (used in ITS-G5 or WAVE), which implements intelligent transport systems operating in the 5 GHz frequency band. During the implementation section of the system, there'll be several older vehicles while not such instrumentation that may cause hazard as info concerning them won't be obtainable to vehicles equipped with IEEE 802.11p modules. In this paper, we have a tendency to gift a system to be used as a edge unit (RSU), developed explicitly for infrastructure-to-vehicle (I2V) communication that can solve the mentioned traffic safety problems. The system consists of a universal medium-range radar (UMRR) and an IEEE 802.11p modem integrated together to detect vehicles, with or without communication capabilities, and forward their position and speed vectors to vehicles, with IEEE 802.11p modules put in, for collision dodging. Tests are performed by exploitation our system in parallel with vehicles within which IEEE 802.11p modules are installed and comparing the content in the Cooperative Awareness Messages obtained from both systems. Accuracy tests are performed so as to verify the system, and Kalman filtering is applied on the measuring system knowledge to enhance the accuracy of the system.

2.3 Multiple Traffic Control Using Wireless Sensor and Density Measuring Camera

Amrita Rai and Govind Singh Patel has explained that in the gift situation transport travel is increasing everywhere the planet, particularly in giant urban areas. Therefore for simulating and optimizing control to higher accommodate this increasing demand is arises. In this paper we tend to studied the optimisation of stoplight controller during a town mistreatment wireless detector and CCTV (Camera). We have projected a stoplight controller and machine that enable us to check completely different scenario of traffic density in town and dominant the traffic of entire town by visual monitoring using CCTV. Using wireless detector we are able to simply senses the density of traffic as a result of the overall design of wireless detector network is associate infrastructure less communication network.

3. EXISTING METHOD

3.1 IR TECHNOLOGY

The main aim of this system is to develop the desired system is to prevent the accidents by drowsiness. Here IR reflective obstacle sensor is used to detect the position of eye. Basically the attention blinking rate is zero.3 seconds, so for detecting drowsiness, it should be greater than the blinking rate for transmitting and receiving signal of eye. If the eyes ar closed until four sec then the sensing element provides high signal to the controller. The output from the sensor is passed to the 16F877A PIC controller. Here Controller gets the high or low signal and method it to create the buzzer ON or OFF and show|LCD|digital display|alphanumeric display} to display the info “driver slept”. When controller detects drowsiness, buzzer gets continuously ON, giving notification on LCD Display. This will help to protect driver from drowsiness and it will help to prevent accidents efficiently(Rashid Hussian 2013).By using IR sensor module kit, monitor the eye blinking ratio rate which is strongest cause of accidents due to drowsiness. Eyes of driver measures blinking rate bigger than four seconds, then it gets indication to driver by activating buzzer and tries to awake driver from temporary state.

3.2 RF TECHNOLOGY

If a vehicle has meet accidents, straightaway an alert message with the placement coordinates is shipped to the centre. From the center, a message is sent to the nearby ambulance. Also an indication from centre is transmitted to all or any the traffic junctions in between the machine and vehicle location. Also alert message intimation is given to the surrounding vehicles which are near to the accident vehicle, to the police control room and also to their relatives. The vehicle accident was detected by the microcontroller within the vehicle unit exploitation vibration device and message is passed to the management unit. After the acknowledge signal management unit management the stoplight section through RF communication of automobile unit. Then the ambulance will control the traffic signals which are in the path to the hospital automatically. Thus the ambulance will reach the hospital in a faster manner. This system consists of 4 main units, which coordinates with each other and makes

sure that ambulance reaches the hospital without any time lag. Thus, our system is split into following four units,

- The Vehicle Unit
- Control Unit
- The Ambulance Unit
- Traffic Junction Unit

The vehicle unit installed in the vehicle, it senses the accident and sends the location of the accident to the control unit. The management unit finds the closest machine to the accident spot and therefore the shortest path between accident spot and therefore the nearest hospital. The management unit sends nearest path to the acknowledged automobile. Also, this information is transferred to the all traffic controls unit nodes in the path of ambulance and makes it ON, which ensures that the ambulance reaches the hospital without delay. Same time the accident happened vehicle unit conjointly sends the accident data spot to the near vehicles.

4. PROPOSED SYSTEM

4.1 BLINDSPOT SYSTEM: The blindspot monitor may be a vehicle-based device that detects different vehicles settled to the driver's facet and rear. They may conjointly embody "Cross Traffic Alert", that alerts drivers retreating of a parking zone once traffic is approaching from the perimeters.

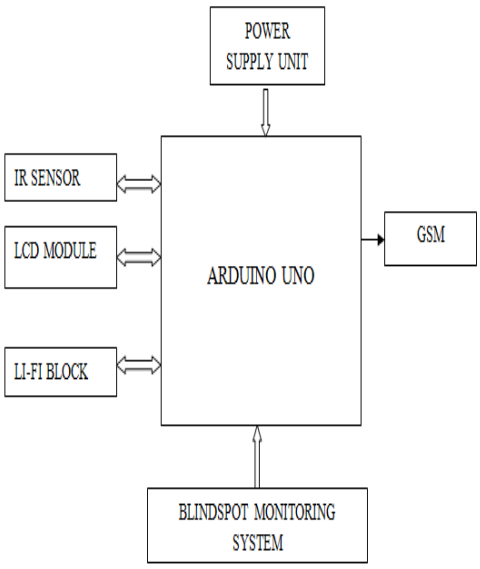

Fig.3.1 Block diagram of accident preventing system

This optical wireless communication (OWC) technology uses lightweight from light-emitting diodes (LEDs) as a medium to deliver networked, high-speed communication in a very similar manner to Wi-Fi. Visible light communications (VLC) works by switching the current to the LEDs off and on at a very high rate, too quick to be noticed by the human eye. Although Li-Fi LEDs would have to be compelled to be unbroken on to transmit knowledge, they could be dimmed to below human visibility while still emitting enough light to carry data. The light waves cannot penetrate walls that makes a far shorter vary, though more secure from hacking, relative to Wi-Fi. Direct line of sight isn't necessary for Li-Fi to transmit a signal; lightweight mirrored off the walls can do seventy Mbit/s.

4.2 GSM: GSM uses a variation of your time division multiple access (TDMA) and is that the most generally used of the 3 digital wireless telecom technologies: TDMA, GSM and code-division multiple access (CDMA). GSM digitizes and compresses knowledge, then sends it down a channel with 2 different streams of user knowledge, every in its own time interval. It operates at either the 900 MHz (MHz) or one,800 megacycle band. GSM, in conjunction with different technologies, is an element of the evolution of wireless mobile telecommunications that has High-Speed Circuit-Switched knowledge (HSCSD), General Packet Radio Service (GPRS), increased knowledge GSM atmosphere (EDGE) and Universal Mobile Telecommunications Service (UMTS).

4.3 LI-FI: Li-Fi may be a technology for wireless communication between devices victimization light-weight to transmit information and position. In its gift state solely diode lamps are often used for the transmission of visible radiation.Li-Fi could be a visible radiation communications system that's capable of transmission knowledge at high speeds over the visible radiation spectrum, ultraviolet and infrared emission. Using light to transmit data allows Li-Fi to offer several advantages like working across higher bandwidth, working in areas susceptible to electromagnetic interference and offering higher transmission speeds.

4.4. WORKING PRINCIPLE: While the vehicle is moving on the roadside, many vehicles can be rushing up at the same time. So that there may be a chance of getting accidents over the roads. To avoid these kind of possibilities, the proposed system consists of Li-Fi module where the light source from the trasmitter vehicle the information about the location of the vehicles can be observed by our receiver vehicle and this indicates the distance of the closest object and provide a relief from the disaster. Also, blindspot monitoring system provides the information about the vehicles from the invisible through an notification alarm/buzzer. Here, GSM helps to provides and density of the vehicles in our path. IR sensor module detects the obstacles or any other interrupts (any situation that leads to accident) between the vehicles traveling on the roadsides and provides a warning alert through LCD display.

SOFTWARE USED

- **EMBEDDED C**
- **PROTEUS 8PROFESSIONAL**
- **ARDUINO IDE**

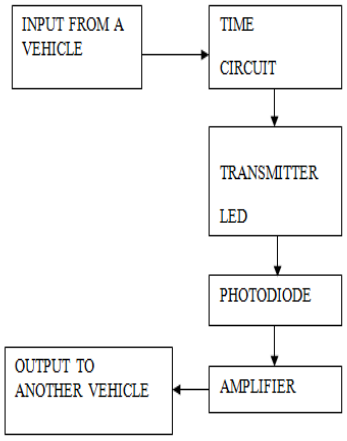

Fig.3.2

Block diagram of LI-FI

5. SIMULATION

RESULT:

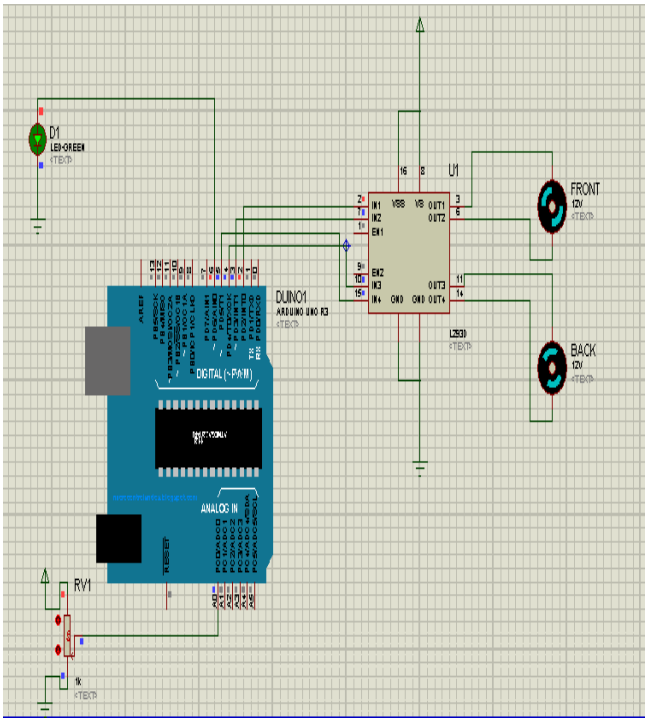

Fig.5.1 Simulation Result using Proteus 8 professional

6. CONCLUSION

Traditional control system isn't enough to regulate this traffic density; control system needs some improvement to the prevailing system to avoid the traffic jam. The density of the vehicles is obtained by connecting the IR sensors. And looking on the density of the vehicles the light signals are controlled by the microcontroller. The vehicles can even modification the route if the traffic is serious within the current route and knowledge relating to serious traffic is provided to vehicles prior to through the GSM. At the same time we also have to concentrate on the accidents happening at the very remote corners at some particular areas where one side road is invisible to the other side.

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