Intelligent Information Sharing System for Vehicles

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***Abstract*:- For the realization of a safe road traffic environment a wireless communication system which makes an information network between vehicles has been needed. A prototype of vehicle-to-vehicle communication system is developed by using a wireless communication and a car navigation system equipped with GPS. By interoperation wireless network, it was possible to communicate in a wide area and with little delay time in a local area. The system can exchange the necessary information between vehicles, in form of the location of the ones that have an accident risk, and give an alarm by employing the developed algorithm for estimating the collision risk between vehicles.**

1.INTRODUCTION

In the recent years, traffic accidents have become one of the leading causes for death all over the world, hence road safety has been greatly concerned. At the same time, we are facing the pressing needs for convenience and commercial oriented applications onboard. Vehicle-to-vehicle (V2V) communication[1], as a promising technique of intelligent transportation system, has been proposed to meet these needs. Existing vehicle-to-vehicle safety systems together with new cooperative systems using wireless data communication between vehicles which can potentially decrease the number of accidents on the highway road in India i.e. transmit the messages within deadlines. Over the past decade, V2V communications have attracted a lot of attention and various applications have been developed, such as the cooperative forward collision warning, traffic light optimal speed advisory, remote wireless diagnosis, etc.

Imagine that you're approaching an intersection at about 30 mph, with a green traffic light beckoning you through. What you can't see, however, is that another vehicle, coming in on the cross street, is about to run a red light. In a typical car, you would enter the intersection and most likely be slammed in the side by the other vehicle, which could seriously injure or even kill you. But in this car, a prominent red warning light flashes on the dash and an alarm blares, giving you time to hit the brakes before entering the danger zone.

That is one of several scenarios in which an ambitious new safety system being developed by the government, universities, and major automakers could help prevent an accident. The system allows cars in the same area to instantly communicate with one another over a wireless network, exchanging data about each vehicle's speed, location, and direction of travel. With that information, the system can determine whether a crash is likely and warn drivers to brake. In more advanced designs, it can even brake the car if a driver doesn't respond quickly enough. To some, this may seem like a Big Brother approach to monitoring driver behaviour, but according to the National Highway Traffic Safety Administration, such a system has the potential to help drivers avoid or minimize up to 80 percent of crashes involving unimpaired drivers. Implementing connected-vehicle technology on a mass scale is still several years away, and it will need to address concerns about privacy and cyber security to be accepted by the public. But we're already seeing forms of connectivity on the road that can help drivers get where they're going safer, faster, and more efficientl

B.Literature views

Xiaoxiao Jiang and David H. C. Du proposed a system on a bus vehicular network integrated with traffic infrastructure. In their paper, they propose a new two tier bus VANET the fully integrated with traffic infrastructures for improving the performance of VANET. They take advantage of RSUs and TCC that already required and constructed by ITS and investigate how much benefits they can obtain form this realistic environment. By integrating RSUs and TCC with buses, the coverage of the high tier nodes can be ensured and the possibility of packets carrying is reduced. TCC helps us quickly identify the location of the destination vehicle. Comparing to traditional VANET, better performance of our BUS-VANET can be achieved with less delivery delay and higher delivery rate

U. Kumaran and Dr. R. S. Shaji works on vertical handover in vehicular ad hoc network using multiple parameters. In their work they compared single criteria decision marking, multi-criteria may increase the handover delay as it considers several parameters to decide the handover. Number of handover is a fundamental parameter in handover due to resource management. Unnecessary handover may reduce the network performance in terms of throughput and network occupancies. However, the implementation of multi-criteria decision making in the vertical handover decision algorithm of a vehicular ad hoc network increases the network performance in terms of number of hand off and load balance index.

III. IPROPOSEDSYSTEM

Vehicle-to-vehicle communication systems, commonly called V2V, are designed to prevent crashes in a number of scenarios. Federal officials have conducted several driver clinics over the past year in which public volunteers have been able to experience the technology and see how these features can help them avoid accidents:

Intersection assist.
When you approach an intersection, it alerts you if another vehicle is traveling at such a speed on a cross street that it could run a red light or stop sign and hit your car in the side. This helps prevent common and often fatal T-bone accidents.

Left-turn assist.
When in an intersection, it alerts you if there's not enough time to make a left-hand turn because of oncoming vehicles. This can keep you from turning even when you can't see the oncoming car.

Do-not-pass warning.
When driving on a two-lane road, the system warns you when a vehicle coming in the opposite direction makes it unsafe to pass a slower moving vehicle. Advance warning of a vehicle braking ahead. The system emits an alert when a vehicle that's two or more cars ahead in the same lane— and possibly out of sight— hits the brakes unexpectedly. This can help prevent a rear-end collision when you're caught by surprise.

Forward-collision warning.
A warning will sound if the system detects that you're traveling at a speed that could cause you to hit a slower-moving vehicle in the rear. It will also give you advance warning of a stopped vehicle in your lane that you may not see because of a vehicle in front of you or because it's around a bend in the road.

Blind-spot/lane-change warning.
When traveling on a multilane road, this illuminates a warning light when a car is positioned in your blind spot. It also emits a loud beep if you activate your turn signal when it's unsafe to change lanes.

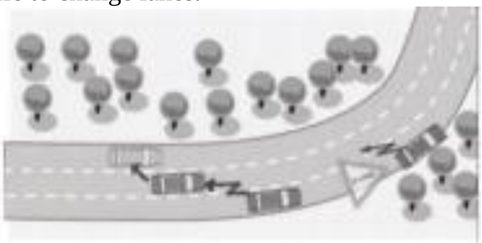


Fig 1: Blind spot/Lane changing

Fig 2: Car in trouble situation

Collision risk

Anti-breaking System:- Anti Breaking system is used in Emergency situations. It will automatically stops\slows down the vehicles.

Heart rate Sensing: This makes sure the driver is safe to drive the vehicle. Else, indicates the nearest emergency service station/Health related station.

Co2 Monitoring: This is used to monitor the Carbon Monoxide level emitted from vehicle. This is useful in controlling pollution.

Drowsiness State Monitoring: This part of the system makes sure the driver is not sleepy. If it found the driver is in sleepy condition then the system will alert with the help of Alarm.

IV.BLOCK DIAGRAM

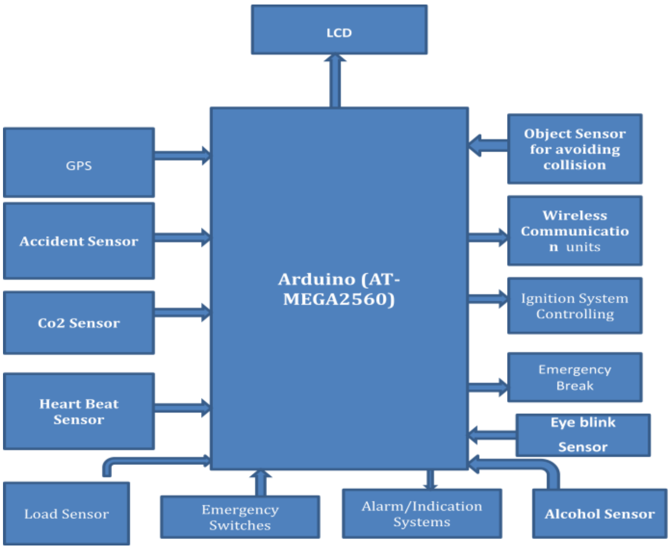


Fig 3: Block Diagram

A. AT-MEGA 2560.

Microcontroller ATmega2560 Operating Voltage 5V Input Voltage (recommended) 7-12V Input Voltage (limits) 6-20V Digital I/O Pins 54 (of which 14 provide PWM output) Analog Input Pins 16 DC Current per I/O Pin 40 mA DC Current for 3.3V Pin 50 mA Flash Memory 256 KB of which 8 KB used by bootloader SRAM 8 KB EEPROM 4 KB Clock Speed 16 MHz

Power The Arduino Mega can be powered via the USB connection or with an external power supply. The power source is selected automatically.External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector.

The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.The Mega2560 differs from all preceding boards in that it does not use the FTDI USB-to- serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter.

Liquid-crystal display (LCD).

It is a flat panel display, electronic visual display that uses the light modulation properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock.

Software Requirements:

- Embedded C Operating System :Windows XP/Vista/8/8.1/10
- Keil 5
- Arduino IDE

Hardware Requirements:

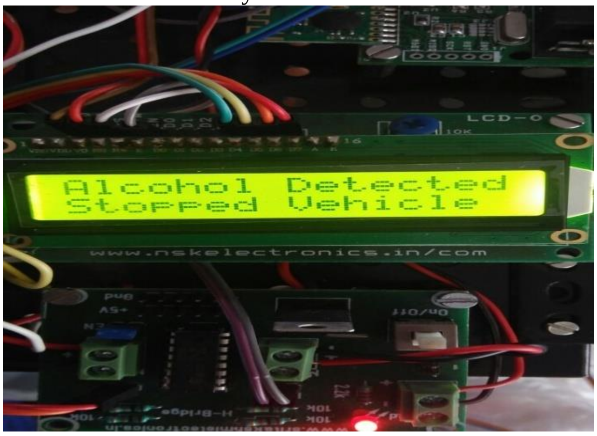
- 1 x L298 bridge IC
- 1 x DC motor
- 1 x breadboard
- Jumper wire.
- ATmega256.
- Robot Assembly
- GPS modules
- Wireless Communicator Zigbee/RF
- Fire, Smoke, and other sensors
- Power Supply, Battery, wires etc

V.RESULT

Upon the conclusion of the project we can monitor the health status of the driver, monitor the fire and gas on vehicles, monitor the locations of each vehicles etc.

The parameters are displayed on the lcd.

Detects the accident occurred in particular area and updates to other vehicles nearby.



Detects drunk and drive and prevents accidents.

VII.CONCLUSION

Thus with the help of this project we can prevent accidents. We can monitor the health status of the driver, monitor the fire and gas on vehicles, monitor the locations of each vehicles etc.

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