Collision Control and Chain Accident Pileup Due to Fog

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Abstract : Despite their reliability, we are trying to develop a system to the accident information prior to the vehicle control unit so that it enables the vehicle to prevent the happening of accident.Over twenty-five vehicles crashed into each other on Yamuna express highway, due to the dense fog conditions. The wreckage that stretched for over a kilometer caused several casualities. “When a car crossed the center line and collided with another car, cars behind them slowed down. Which eventually turned into a chain reaction crash leading to the pile up,” said Prasanjeet Ghosh, a tourist, whose vehicle was involved in the crash said. In this paper we are using nRf transceiver to share information to the vehicles. If the vehicle gets crash, the information will send to the family members via GSM.

I. INTRODUCTION

Now-a-days, lots of chain accidents happen on highways of Delhi due to smog condition thereby increase in traffic and also due to rash driving of the drivers. A multiple vehicle collision (colloquially referred to as a multi-car collision, multi-vehicle collision, or simply a multi) is a road traffic accident involving many vehicles. Generally occurring on high-capacity and high-speed routers such as freeways, they are one of the deadliest forms of traffic accidents. The most disastrous pile-ups have involved more than a hundread vehicles. And in several things the members of the family or the automobile and police authority isn't knowing in time. In extremely inhabited countries like Bharat, everyday people lose their lives because of accidents and poor emergency facilities. These lives might are saved if medical facilities square measure provided at the proper time.

This lead to delaying the assistance reached to the person suffered because of accident. Rapid growth of technology and infrastructure has created our lives easier. The advent of technology has also increased the traffic hazards and the road accidents take place frequently which causes huge loss of life and property because of the poor emergency facilities. This paper will provide an optimum solution to this drawback.

Chain-reaction crashes may occur in conditions of fine visibility, once ice or different road hazards square measure encountered unexpectedly as drivers spherical a curve or crest a hill.

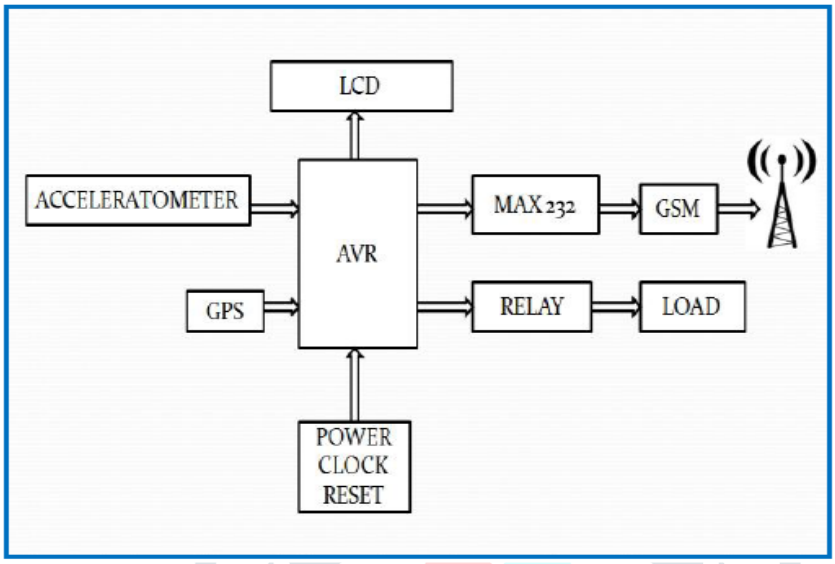
Another chance could be a third vehicle is solely too on the brink of the initial collision to avoid hit one or each of the vehicles. Due to the high traffic speeds on the road, if one automobile develops a retardant and suddenly halts, those behind it cannot stop in time and will hit it. Considering that these roads usually have high traffic volumes, a lot of cars area unit forced into braking and skidding, darting into different lanes and ahead of oncoming traffic somore vehicles get involved, making a series reaction impact.

Determining the reason behind such accidents is tough for investigators and it's usually not possible to inform if negligence caused the crash.In spite of their frequency, little formal research has been done in the United Stated regarding their cause or causes. Transportation has great importance in our daily life and it’s development has made of our chores much easy. But it can cause disaster to us and even can kill us through accidents. During 2016, Road Traffic Injuries ranked fourth among the leading causes of death in the worls. Nearly 1.3 million people die every year on the world’s roads and 20 to 50 million people suffer non-fatal injuries, with many sustaining disability as a result of their injury. Road traffic injuries square measure the leading reason behind death among tykes aged 15-29 years and price countries 1-3% of the gross domestic product (GDP).if no action is taken,road traffic crashes quare measure expected to end in the deaths of around one.9million people annually by 2020.Thus accident detection system usng GPS and GSM has gained attention. This system mechanically informs accident to the preprogrammed numbers.

II. PROBLEM DESCRIPTION

EXISTING SYSTEM

Accelerometer sensor can be used in car security system to sense vibrations in vehicle and GPS to give location of vehicle, so dangerous driving can be detected. When accident occurs, Accelerometer will detect signal and will send signal to AVR controller, microcontroller will enable airbag to blow and message with accident location is sent to preprogrammed numbers such as ambulance, police station, etc via GSM. Microcontroller supports TTL voltage levels. MAX232 is used to convert TTL voltage levels into RS232 voltage levels and vice versa.



A. Global System for Mobile Communication(GSM):

GSM is global system for mobile communication and used to send messages to preprogrammed number. The modulation technique used is GSMK. The protocol used by GSM modem for setup and control is based on the Hayes AT-command set. AT is the abbreviation of attention. GSM AT commands are extension commands.

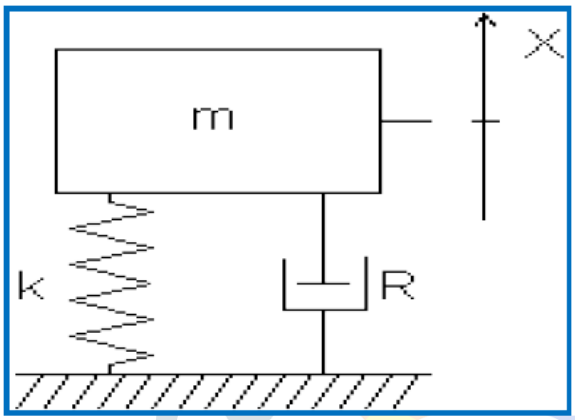
Parameter	Specifications
Forward Channel Frequency	935-960MHz
Reverse Channel Frequency	890-915MHz
Tx/Rx Frequency Slotting	45MHz
Tx/Rx Time Slot Spacing	3 Time slots
Frame Period	4.615ms
Users per Frame	8
Time Slot Period	576.9µs
Bit Period	3.692µs
Modulation	0.3GMSK
Modulation Data Rate	270.833333kbps
ARFCN Number	0 to 124 and 975 to 1023
ARFCN Channel Spacing	200KHz
Interleaving	40ms

B.GPS Receiver

The system(GPS Global Positioning) is a space age navigational system that can pinpoint your position anywhere on the globe, usually within a few yards or meters. GPS uses a constellation of 24 satellites in precise orbits approximately 12,000 miles above the earth. The satellites transmit data via high frequency radio waves back to earth. GPS uses satellite ranging to triangular your position. In other words, the GPS unit simply measures the travel time of the signals transmitted from the satellites, then multiplies them by the speed of the light to determine exactly how far the unitbis from every satellite it's sampling. Distance= velocity(speed)*time.

C.Accelerometer

An Accelerometer is a Micro-Electro Mechanical System (MEMS) sensor which measures static (earth gravity) or dynamic acceleration in all three axes. It measures level of acceleration where it is mounted which enable us to measure acceleration/deceleration of object like car, or tilt of a platform with respected to earth axis, or vibration produced by machines. It measure in terms of 'g'. Accelerometer converts mechanical motion into electrical output.



Disadvantages

The main disadvantage of the system is that it will not send information about crash to the vehicles behind.

This traditional sensor system is not up to detect the possibility of collision when inter vehicle spacing is small.

We cannot actually relay on the collision detection mechanism which is based on sensing at larger distances.

III. PROPOSED SYSTEM

First, the new framework of chain of Road Traffic Incident (CRTI) is proposed, in which the observed vehicle movement features are viewed as road traffic system's external "performance" that, in essence, reflect the internal "health states" (safety states) of the system at a specific time. This paper presents vehicle accident detection and preventing chain accident in fog condition. The vehicles which consists of long distance sensor will sense the crash occurs in front vehicle in order to avoid chain accident. Vibration sensor is used for preventing the accident when the vehicles come closer. The nRf transceiver sends information to the vehicle of an accident that happens in front. The information send through the nRf receiver will be updated in the LCD. All the components are interfaced precisely so that the accident detection is reduced significantly.

KIT 1

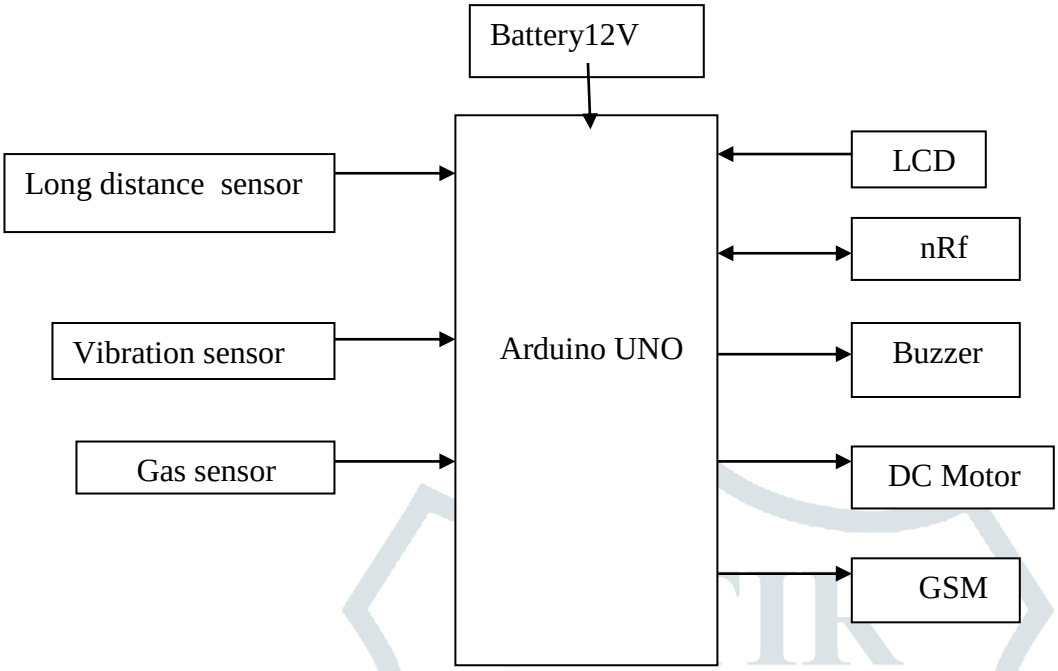
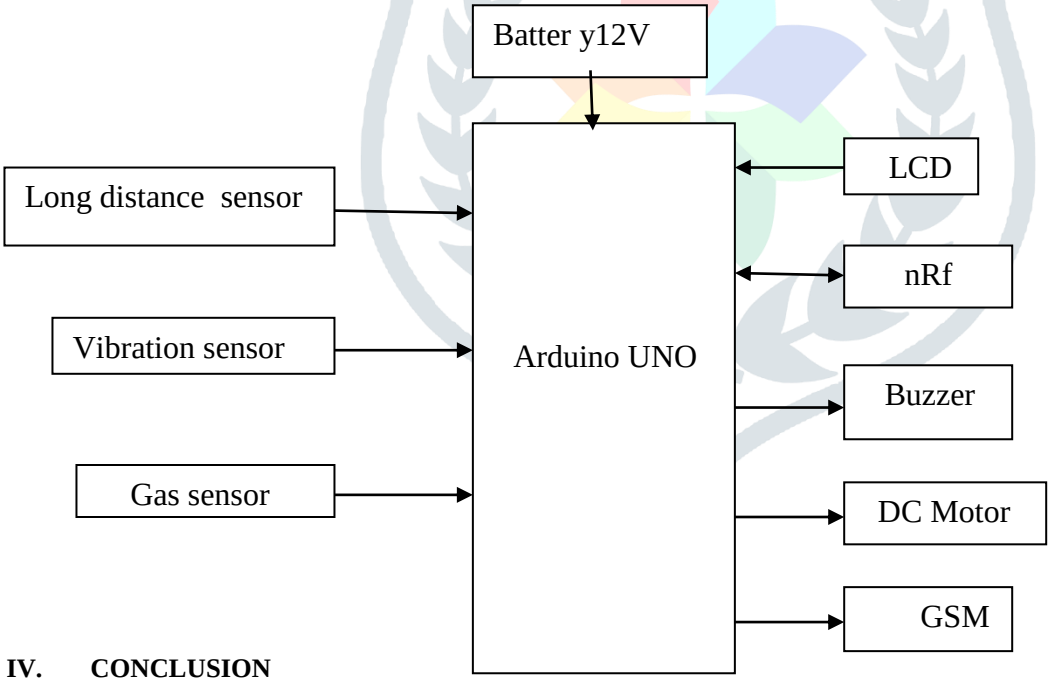


FIG: block diagram

KIT 2



IV. CONCLUSION

Driving safety is one of the most important issues in car industry. There are some researches trying to provide collision warning systems to achieve the goal of more safety. In this project, we have successfully designed a system for collision avoidance, gas leakage detection and communication between different vehicles.

The above system could further be improved to avoid accidents by performing lane detection. We can implement all sensors in one car to detect speed measurement, to determine vehicle parameters.

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