International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 04 Issue: 11 | Nov -2017 www.irjet.net p-ISSN: 2395-0072

Ultra Smart Integrated vehicle controlled system

M. Anjaneyulu[1], B. Mani Kumar[2]

[1]*Student, Department of ECE, Kasireddy Narayana Reddy College of Engineering and Research, Hyderabad, India.*
[2]*Asst.Prof, Department of ECE, Kasireddy Narayana Reddy College of Engineering and Research, Hyderabad ,India.*

***Abstract**: In todays fast nd busy world major accidents are occurs due to the wrong indication to nearby vehicles and also on curved roads head light intensity and also drivers negligibility to observe surroundings. These fats indicates we need automatic indicator system and anti collision system driver alert system. additionally we must need communication system among the vehicle to others when we got the accidents. Finally we need a conventional vehicle system which must have the before explained characteristics. This paper explains the prototype model of intelligent vehicle system which consist anti collision system and automatic indicator on-off system. And also steering based automatic rotate head light system vehicle to others communication system. Proposed System very cost efficient and reliable. This can be placed on any vehicle.*

Key Words: **Adaptive Headlight, Headlight intensity, Anti-collision, Indicator, Curved Road, Servo motor, GSM, GPS**

I. INTRODUCTION

Our proposed system is based on Smart and safe vehicle System .in now a days accidents are major issue in human life. In recent survey it is clear that one person dreads for every 4 minutes in accident. Our Prime Minister Narendra Modi is also said in his famous show " MAN KI BAAT " . in major accidents youngsters are getting dead. As citizen of Indian we must stop these accidents to built Young India.

As per the study major causes for the accidents are curved roads. At the curved roads while taking turn driver must inform to the near by vehicles with indicator. By negligence if he not uses indicator it will cause to the wrong info to the other vehicles. During the night time sunlight will be dim at that time head light intensity must need for clear visibility. While taking the turn on the curved roads head light intensity will be straight. This will cause to road invisibility due to this driving may be unsafe. Now-a-days private taxis are in boom and it has raised the question of security of passenger, especially for women, for instance recently occurred Uber taxi cases in New Delhi. In order to deal with all the problems explained above we have proposed a smart vehicle system solution. There are many scenarios we have considered for our application as follows,

- Adaptive steerable headlight system.
- Headlight intensity control.
- Automatic indicator off system.
- Anti-collision mechanism.
- Vehicle to Vehicle communication.

In adaptive headlight system head lights will rotate on the basis of steering. This head light movement will gives us better visibility on the curved roads. Here we also controlled the head light intensity depends upon sunlight by using LDR sensor. When the sunlight is dim at any time that means either night time or day time head intensity will changes automatically. whenever we are going fast on road if any vehicle comes near driver will get the confuse at that time he may unable to controlled the vehicle. For this in this paper we are proposing anti collision system. In This i am using IR sensors for obstacle detection. By using these sensors whenever obstacle is detected that means other vehicle comes near it will tells to the controller to apply the breaks depends upon obsatacle distsnce and also worn to the driver by buzzer sound.

In other way in many accidents we are observing that communication problem to the family members after getting the accidents in non rush areas. This problem will be over come by using GSM module and GPS module. When the vehicle get crash by any vehicle or by anything simple text message (SMS) will be sent to family members and to near by police station along with location.

II. LITERATURE SURVEY

Road accident is a major problem our nation is facing today. Survey reports by National Crime Records Bureau, Ministry of Road Transport & Highway, and Law commission of India, Global status report on road safety 2014 shows following statistics-

- 16 children die on Indian road daily
- One death every four minutes due to road accident
- One serious accident per minute and 16 die every hour
- 1214 crashes everyday & 377 die every day.

Even if headlights are supposed to help the driver in driving, it may cause glaring problem. According to the SAE (Society of Automotive Engineers) rule of automotive illumination, in dim mode it should be 700 lumens and in bright mode it should be 1200 lumens, when tested away from 50 feet from vehicle .Study shows that if our eyes are exposed to bright light source more than1000 lumens even from 20 feet, even we are facing glary problem .in many surveys major accidents are due to uncertain headlight system.

A Report on Road Accidents in India 2016, published by Transport Research wing under Ministry of Road Transport & Highways, Government of India, has revealed that more people died on roads accidents in India last year, as compared to the number of deaths in 2015. As per the data cited in the report, the country recorded at least 4,80,652 accidents in 2016, leading to 1,50,785 deaths. The number suggests that at least 413 people died everyday in 1,317 road accidents. Further breaking down the statistics, the data reveals that at least 17 deaths occurred in road accidents in 55 accidents every hour in the given time period. Comparing the new recordings with data from previous year shows that in spite of recording fewer accidents in 2016, more deaths have occurred this year as in 2015. In 2015, 1,46,133 people had died in 5,01,423 accidents. The accident severity, which is measured as the number of persons killed per 100 accidents, was recorded at 29.1 in 2015 which is lower than 31.4 in 2016. According to the publication, the age profile of road accident victims for 2016 reveals that the youth of age group 18 - 35 years accounted for 46.3 per cent (69,851 persons) and age group of 18-45 accounted for a share of 68.6% (1,03,409 persons) and working age group of 18-60 accounted for a share of 83.3 per cent (1,25,583 persons) in the total road accident fatalities.

The number of road accidents relative to population, registered vehicles and road length are on a general declining trend from 2010. Number of accidents per lakh population declined from 42.5 in 2010 to 37.9 in 2016. Number of persons injured per lakh population decreased from 44.8 in 2010 to 39.0 in 2016. Number of persons killed per lakh population marginally increased from 11.4 in 2010 to 11.9 in 2016.

According to the publication, the age profile of road accident victims for 2016 reveals that the youth of age group 18 - 35 years accounted for 46.3 per cent (69,851 persons) and age group of 18-45 accounted for a share of 68.6% (1,03,409 persons) and working age group of 18-60 accounted for a share of 83.3 per cent (1,25,583 persons) in the total road accident fatalities.

III. DESCRIPTION

A. BLOCK DIAGRAM DISCRIPTION

The system can be represented using block diagram as shown below.

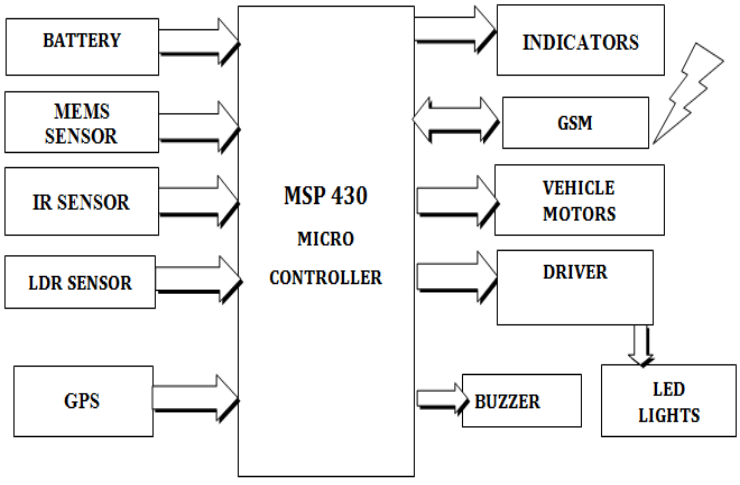


Fig1. Block diagram of smart vehicle system

This work is aimed at producing a cost effective smart, secured and safe vehicle system. We have built a prototype model which as shown in above block diagram. Following is the hardware description.

B. MSP 430 MODULE - The Texas Instruments (TI) MSP430 family of processors are low power 16 bit devices. They are marketed at low power applications such as battery devices, however in spite of this they contain a sophisticated processor core and depending upon the model, a useful array of integrated peripherals. TI produces a set of microcontrollers based around a core 16 bit CPU . Different members of the family include different peripherals and different amounts of memory. They all include a JTAG interface. (JTAG stands for Joint Test Action Group and in this context represents a standardized interface to the microcontroller that can be used for control and monitoring during program or system testing and debugging). Product designers choose the particular family member that best suits their application, generally speaking, cost and power consumption increases with sophistication.

C. POWER SUPPLY UNIT- on board 12V batter will used to run DC motors and to operate MSP 430 provides 5V. and 3.5 volts to IR sensors, MEMS sensors and LEDs. Special power modems will use to GSM and GPS modems

D. STEERING SYSTEM- For steering system here we using mems sensor whenever values of X,Y,Z values of sensor changes controller will controls the LM293D driver circuit. On base MEMS values turns will be taken by prototype vehicle

E. INDICATORS- there'll be 2 indicators. they're driven by 5V provide connect via resistor to limit this. they're additionally connected to the MSP 430 module therefore on throw it automatically turns ON/OFF.

F. LED DRIVERS- needed for interfacing low-level logic circuitry and Power LEDs. ULN 2803 high voltage, high current Darlington arrays are used.

G. LDR SENSOR- LDR sensor is light dependent Resistor. It will changes its resistance value by falling light intensity on this Sensor .for the low intensity resistance will be low resistance will be higher for higher intensity light. By considering resistance value we are controlling our head lights

H. HEAD LIGHTS- for head lights we are using two18mm white LEDs for prime beam and additionally two 5mm LEDs for side beam

I. IR SENSOR-IR sensor consist one LED and one photodiode. LED always emits light whenever obstacle was obtained that light ray will be reflect back. That reflected light ray will falls on the photo diode at that time the sensor output will be high and indicates to controller and controllers will stops the vehicle

J. SERVO MOTOR- These are the motors have flexibly rotation on base of wheel rotation. Headlights will attach to these motors

K. DC MOTOR- simple dc motors are being used as wheels of the prototype model. they're driven by 12V on board battery supply.

L.. MOTOR DRIVER- this is also known as H bridge. It will helpful to run the motors properly in any direction by supplying appropriate voltage. It has 8 I/O pins 4 for input and 4 for output.

M. GSM module-in our system we are using GSM module. It will useful to communicate with others by sent text message.GSM stands for Global System for Mobile communication.

N. GPS module- GPS module is used to know the current location.GPS stands for Global Positioning System.

Components List

- MSP 430 Controller
- IR sensors
- Power LEDS
- Servo motor
- Motor driver IC-L293D
- LDR
- Potentiometer
- LCD
- LM324 amplifier IC

- GSM module
- GPS module

Software's Used

- Proteus 8
- Energia
- Keil Micro vision 4

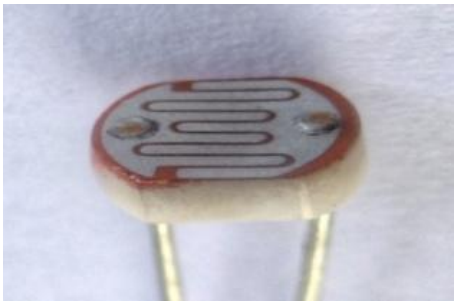
IV. WORKING

Module-wise working is explained below;

A. ADAPTIVE HEADLIGHT- In current vehicle system MEMS sensors are using for steering purpose. Wheels will be rotates based on MEMS movement that means whenever the MEMS values changes the controlled will notified the changes value and controls the vehicle moment with the help of LM293D. The head lights are mounted to the vehicle with the help of servomotors. These motors rotation will depends upon wheel rotation due to similar movement of both at the curved roads head light intensity will be adaptive. Due to this feature driver can drive safely by observing the curved path of road.

Fig2. Proposed Adaptive Headlight System

B. HEAD LIGHT INTENSITY CONTROL- Whenever weather conditions changes the sunlight intensity will also changes automatically. This light intensity changes will cause to accidents because poor visibility to driver. Sometimes day time man may forget to OFF the head light this leads to decrease the life period of battery. Head light intensity control system useful to control the intensity of the light. In this system LDR sensor will be used. The Resistance of sensor changes according to sunlight intensity. For the dark light situation the head light intensity will be increase and decreases for the low head light intensity. This Sensor will placed at outside the vehicle to study light intensity.



A.Fig3. LDR sensor

Many times we forgot to switch of the indicators this tends to false indication to the other vehicles and cause to accidents. In our system we automatically switch ON/OFF the indicators while turning the vehicle. If vehicles turns to any direction at that time controller can turns ON the indicator respect of turn side. These will be switch OFF indicators automatically by the controller when vehicle is in straight direction.

C.ANTI COLLISION MECHANISM- Microcontroller will works on echo signal system. For the echo we are used 2 IR sensors one at the front side and another at the back side. IR sensor detect the echo signal when the obstacle is detected. If micro controller receives signal from IR sensor it will activate the break system the vehicle will be stopped. It will reduces the collisions. When obstacle is detected by IR sensor controller can also warn to the driver by ringing the buzzer and also applying the breaks.

Fig4. IR sensor

D. VEHICLE COMMUNICATION- We have achieved this by using GSM (Global System for Mobile Communication) module and GPS module. If the vehicle gets accident simple text message (SMS) will be sent to the desired number that number may belongs our family or friends and also SMS can sent to near by Police Station along with location. This location will captured by GPS (Global Positioning System) module. We can also implement it to SOS call.

Fig5.GPS module

Fig6. GSM module

V. ADVANTAGES

- Automatic controlling of headlights and its intensity and indicators.
- Accidents will be reduced
- It can be easily maintained on any car or bus or on Sports bikes
- Better solution for curved road journey
- Quick response time.
- It is cost esteemed solution for safety vehicle system
- Increase safety in Road travelling
- Human effort will be reduces

VI. APPLICATIONS

- In Automobiles Four wheeler like cars
- In two wheeler like sports bikes etc.
- Smart Vehicles required for smart city
- In heavy traffic cities.
- In driving learning vehicles

VII. CONCLUSION

Intelligent smart, Safe and Secured vehicle system is more useful in now a days. While increasing the population the uses of the vehicles are also increase rapidly. The increase in uses of vehicle leads to heavy traffic. By using this proposed system simply we can reduce the collisions. This proposed system is economically very cheap thus it can be easily mount on any vehicle. By extending this system we can design automatic driving system for trucks in mines.

VIII. ACKNOWLEDGEMENT

We acknowledge the efforts by the experts who have contribution towards the development of the different automation systems. We acknowledge the help and suggestions by our teachers and guide. We also acknowledge the support given by the reviewers of the journal for modifications and suggestions to improve the quality of paper.

REFERENCES

[1] Mr. K. kaliyrasu Dr. C. Karthikeyan: "Design of an Automotive Safety System using Controller Area Network" IEEE International Conference on Robotics, Automation, Control and Embedded Systems, 18-20 February 2015 [4432-4436].

[2] Shreyas S, Kirthanaa Raghuraman, Padmavathy AP, S Arun Prasad, G. Devaradjane: "Adaptive Headlight System for Accident Prevention" IEEE International Conference on Recent Trends in Information Technology -2014, [111-117].

[3] Muralikrishnan. R: "Automatic Headlight Dimmer a Prototype for Vehicles", IJRET-Volume 3, Feb-2014[85-90].

[4] Jyotiraman De: "Universal Adaptive Headlight System" IEEE International Conference on Vehicular Electronics and Safety, December 16-17, 2014, [7-10].

[5] Shival Dubey and Abdul Wahid Ansari: "Design and Development of vehicle anti-collision system using Electromagnetic and Ultra sonic Sensors" ISSN: 2319–3182, Volume-2, Issue-1, 2013 [82-83].

[6] Dhruv Gupta, Gunvantsinh Gohil, Mehul S Raval:" Driver Friendly Headlight Controller for Driving in Developing Countries", ISSN 2231-5381 vol 8 issue 10-dec 2012, [568-573].

[7] Victor Nutt, Shubhalaxmi Kher, Mehul Raval: "Fuzzy

Websites:

www.indianexpress.com/survey
www.ti.com/lit/pdf/slay025
www.dl.icdst.org/pdfs/files
www.electronicshub.org/ir-sensor