

A Survey on Automobile Headlights Adaptive Control System Based on Can/Lin Network

Kalyani Gaikwad¹, Ramesh Mali²

Dept. of Electronics and Telecommunication, MAEER'S MIT College of Engineering, Kothrude, Pune
Maharashtra, India

ABSTRACT: This paper introduces an outline of versatile car headlights framework based on CAN/LIN network. LIN is a serial network protocol used for communication between components in vehicles. Local Interconnect Network transport was especially intended for low-cost communication between smart sensors in car applications. The framework adopts CAN/LIN bus for communication, captures car steering wheel angle, car body's tilt angle, external ambient light illuminance and switching signal and afterward sends them to the corresponding control nodes to control headlights after being handled. In this paper, uses three controller and two communication protocols. This design enhances the security and comfort of the vehicle driving, and increases its reliability.

KEYWORDS: Automotive headlights; Adaptive control; CAN bus; LIN bus, automatic headlight switching,;

I. INTRODUCTION

The exploration of driving security of vehicle is one of the most imperative subjects on the planet. Driving around evening time is the primary driver of high rate of car crash. Safety is the main concern working an engine vehicle, aside from functionality. The static headlamp just gives certain lighting up fields to drivers in the evening and is deficient to serve for bended streets and crossing point, more than 80 percent of all street car crashes happen in darkness and bad weather. Local Interconnect Network transport was especially intended for low-cost communication between smart sensors in car applications. In this paper, uses three controllers which is PIC18f458 and two communication protocol is uses such as CAN protocol and LIN protocol. The information transfer through these protocols. LIN stands for Local Interconnect Network. It is a Protocol created by Motorola to have intra-organize interchanges inside autos.

II. MOTIVATION

Car crashes typically occurred in dim night or in the case of sudden change of lighting. This paper develop a system can effectively broaden the driver's fields of view and improper driving comfort.

III. PROBLEM STATEMENT

The car crashes more often happened in dim light or in the case of sudden change of lighting. Street mishaps happen each day with the higher rate of events around evening time. This is because visibility at night is not as good as that at the day time. The significance of bright driving lights to a vehicle has as much an inverse impact on the restricting vehicle, subsequently the need to diminish that impact. Essentially there is framework which is identified with security for driver at the season of driving in the night drive. The rates of Car headlights are critical parts of car lighting framework. It is likewise shield of driving. At present, the most of the car headlights' illuminating direction is fixed and totally controlled manually, subsequently it exists incredible potential security hazard under complex road conditions. And it usually adopts the independent mode control, which makes the automotive wiring harness complicated and causes serious electronic jamming. Therefore, it might decay the dependability of the framework. What's worse, it may hinder the promotion of the car intelligent level. The significant issue is the intelligent control for the car headlights and reduces the car wiring harness effectively.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Website: www.ijirset.com

Vol. 6, Issue 5, May 2017

IV.LITERATURE SURVEY

In this project, author present system which controls angel of the headlights ,this system is based on the steering wheels for headlights adjustment here two lights are used one is for long distance beam and other is for near distance beam motion of head light depends on the speed of the car threshold is set as 50kmph and LPC 2148 used for processing .DC motor is used for the motion of headlight .The entire system consists of 5 modules: the sensor module, signal conditioning circuit module, the central controller module, D. C. motor drive module, power supply and power protection modules. This article, describes the various hardware performance and the algorithms of the software. The pilot test showed that this system reached the performance requirements of vehicle's advanced curve lighting system at night and had important reference value for improving the advanced curve lighting effects and traffic safety at night [1].

this paper represents the use of CAN\LIN NETWORK for automobiles. CAN bus is a kind of computer network with various network topologies like Bus, Ring, star topology but CAN is very expensive for controlling complete system so we move to words assistant of can called LIN bus . LIN is low cost serial communication bus with communication rate lower than 20kbp. cost of LIN node is lower than that of CAN lode. The network form of CAN bus and LIN bus are analyzed respectively. Both bus network technologies are studied. The difference between the structures is compared. The gateway model of CAN/LIN hybrid network is proposed. Based on the study of regular application scheme of automotive body network, an automotive body hybrid network system scheme with CAN/LIN dedicated gateway is optimized and designed. The scheme features simple structure, low cost and high stability, which facilitates the expansion of subsequent functions and the development of subsequent programs [2].

In this paper, shows the study of local Interconnect network bus it is designed for low cost communication between smart sensors and it is used when high bitrates communication as CAN BUS are not needed. this work present Simulate LIN Protocol and its significance or importance in future Automation Industries through this project. LIN bus can not only lower the cost, but also provide a hierarchical network structure for fully using operational and diagnostic information of fundamental technical devices. LIN Bus gives high degree of immunity against conducted EMI. Apart from these, the system can keep working steadily for long time, which indicates that this design is logical and feasible. In other words, it can be applied in the real vehicle network to replace the existing wiring control units. Single-wire implementation for the LIN bus i.e. weight reduction is maximized. Also, the master/slave architecture avoids the need for contention control of the bus, simplifying hardware [3].

This pare shows the requirement of can bus in automation it shows that we can reduce the point to point wiring harness in automation .also explained other benefits of the CAN bus in automation like increased in inflexibility and expandability for future technology insertion. Shows the ARM7 based design and implementation of CAN bus prototype in Real-time, reliability and flexibility, all these characteristics make CAN BUS an indispensable network communication technology applied in automobile network communication field. In this paper, the CAN-bus based communication system for vehicle automation is designed. Software system and hardware system are easily to be expanded and upgraded [4].

Here they have presented use of communication slandered LIN as a viable replacement to CAN BUS in simple applications , because CAN is relatively complex standard to implement and configure it is also among the most expensive options available. to use CAN for al automotive electronics becomes prohibitively expensive and complex also with increasing in electronics in an automobile there is g surge of information available in the vehicle. This paper showe the need of combination of CAN and LIN network when required and dedicated LIN network when possible to reduce the cost of automation and finally conclude with The number and data transmission speed of the CAN and LIN nodes shall be sensibly chosen, and the parameters in CANalyzer shall be reasonably chosen, to ensure the reasonability of the data and the correctness of the conclusions; The simulation proves that the longer the message transmission delay time, the smaller the network load; the faster the message transmission speed, the smaller the network load. Therefore, to ensure the reliability of data transmission on the LIN bus, considering the performance and costs comprehensively, the LIN connectors with a transmission speed faster than 10Kb/s shall be the best choice. The advantage of VI is the fact that since they are not present physically, they don't take up physical space in a vehicle.OBD systems give the vehicle owner or a repair technician access to state of health information for various vehicle sub-systems [5].

This paper mainly studies the control model and algorithm of vehicles' adaptive front light system when driving on curve roads. They have used FPGA for processing purpose and LIN controller. Focused on control model and simulation on adaptive front line system of vehicle on curve road. This paper put forward control algorithm of adaptive

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Website: www.ijirset.com

Vol. 6, Issue 5, May 2017

front light on curve roads. It can be seen that the front light adaptive output responses under the model and the algorithm in this paper is reasonable by simulation. also considers many factors influencing the change of the front light irradiation angles on turning. It is concluded that when vehicles move on curved roads, the front light longitudinal irradiation distance is controlled by the safe stopping distance, the horizontal irradiation angles of front light are controlled by the changing value of drivers' visual angle, the front wheel swing and side-slip angles, and the vertical irradiation angles are controlled by the lateral roll angle of the object supported by suspension springs. When vehicles move on curve roads, if lateral roll angle is bigger, the front light's vertical angles to be adjusted are bigger, where the front light at inner side makes a downward adjustment and the front light at external side makes an upward adjustment [6].

This paper gives the characteristics of CAN and LIN bus for used in automobile systems. Also gives the implementation of software system. Both software and hardware of low and high speed CAN bus network are designed. Full active suspension control, engine control, airbag control, ASR/ABS/ESP control traction control transmission control are design as high speed CAN. Low speed CAN network consist of air conditioning control, instrument control, wiper control, lighting control, window control and door control. CAN bus is used in automotive field extensively it act as reliable vehicle computer network bus. It has multi-master node, open architecture, error detection and automatic recovery, so that the information can be shared by computer control units in the car with the help of bus. CAN bus standard have been adopted by many car manufacturers, such as Volkswagen, Ford, BMW, Honda for its application and popularization of technology. The research on CAN bus technology has been more perfect and efficient on abroad. In china, the research of CAN bus is later than that on abroad, so CAN bus is still in the development stage, while many scholars are committed to study the new standards of vehicle CAN bus. With the continuous development of CAN bus, CAN bus will be more widely applied in the domain of automotive [7].

This paper has proposed a versatile lighting system for bus interior environment using LEDs controlled through a low cost automotive communication network. The proposed system presents the advantages of using LEDs, such as robustness and long useful life, avoiding the use of magnetic components, EMI and ambient heating. Furthermore, the use of LEDs simplifies the implementation of microcontroller lighting systems, which makes possible to obtain many control options and several system functions. Besides, the use of an automotive network brings versatility to the system, making possible the integration of that with some other systems and, moreover, allowing a practicable installation [8].

This paper has proposed a versatile lighting system for bus interior environment using LEDs controlled through a low cost automotive communication network. The proposed system presents the advantages of using LED lighting, such as robustness and long useful life, avoiding the use of magnetic components, EMI and ambient heating. Furthermore, the use of LEDs simplifies the implementation of microcontroller lighting systems, which makes possible to obtain many control options and several system functions. Besides, the use of an automotive network brings versatility to the system, making possible the integration of that with some other systems and, moreover, allowing a practicable installation. The efficiency improvements and the costs reduction of semiconductor lighting devices are important topics to be addressed for futures system applications [9].

V.PROPOSED SYSTEM

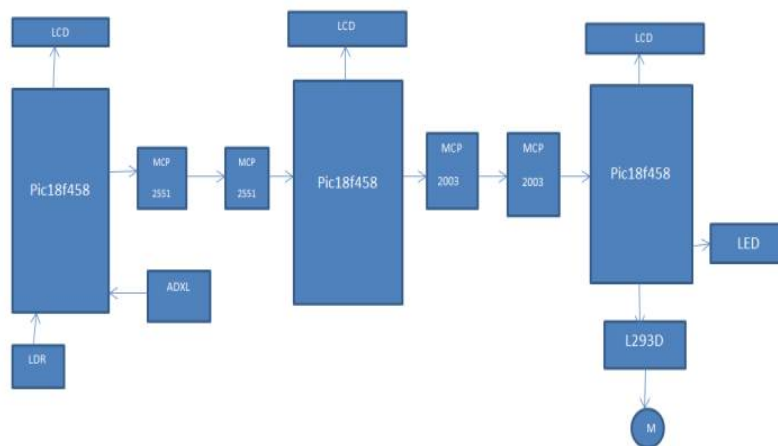
The proposed framework consists of basically the sensor blocks, controller block and the actuator or motor block. The sensor block gives the input to the framework which is then prepared by the controller and afterward the yield is acquired as actuator development or other controlling developments. In this proposed framework focuses is on adaptive front lighting frameworks utilizing diverse sensors which improves driving wellbeing at night time.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Website: www.ijirset.com

Vol. 6, Issue 5, May 2017



Advanced headlights are a dynamic security include intended to make driving during the evening or in low-light conditions more secure by expanding visibility around curves and over hills. When driving around a bend in the street, standard headlights keep on shining straight ahead, enlightening the side of the street and leaving the street in front of you (on bend side) in the dark. Advanced headlights, on the other hand, turn their beams according to your steering input so that the vehicle's actual path is lit up. In this paper, the headlights adaptive control includes: headlights automatic switch control, left -right servo control and pitch servo control. The block diagram of proposed system is shown in figure 1. Above figure consist of three microcontroller namely, PIC18F458. Two communication protocols are used for transmission of data namely, CAN protocol and LIN protocol. Our input is obtained from LDR and I get output from motor. Motor is depending on the LDR. CAN bus have high transmission speed and good arbitration mechanism? LIN is low cost bus as compared to CAN. The utilization of CAN/LIN transport hybrid network can hierarchies the body network, reduce the complexity of automobile network and enhance the unwavering quality and constant of car body control. CAN bus is a piece of the control system and it is a serial communication network, which can support distributed control and real-time control. CAN is a multi master sending system structure. It is a peer-to-peer network. Usually in automotive application, the LIN transport is associated between keen sensors and an Electronic Control Unit (ECU) which is regularly a gateway with CAN bus. As explained above this system contain three type of controls headlight automatic switch control ,pitch control and left right servo control .bye using this we are providing four type of control operations automatic on off oh headlight when required, adjusting light pitch according to road ,bending of head light on curved road and automatic diming of light of light when vehicle arrive from front side at night time.

VI. CONCLUSION

The framework exhibited intelligent control for car headlights, however its knowledge degree still needs moving forward. For instance, the intelligent should also realize the function of headlights low beam and high beam automatic switching when two vehicles meet. At that point, the framework has a specific development. That is to say, it is also suitable to other body control module, for example, doors, windows, air-conditioning, and other automotive electronics control units. This plan enhances the security and solace of the car driving, and expands its unwavering quality. The framework is additionally in accordance with current car electronic wellbeing, vitality sparing, natural security, and insight and data innovation patterns.

REFERENCES

- [1] G.Ravi Kumar: "Advanced Head-Light Controlling System for Automobile" Volume: 03 Issue: 10 | Oct -2016.
- [2] Peng Huang "Study and Design of CAN / LIN Hybrid Network of Automotive Body" Vol. 940, pp 469-474.
- [3] Mr. Sanal K S " Hierarchical Automobile Communication Network using LIN Subnet with VI based Instrument Clusters and OBD-II Regulations" Volume 1, Issue 3, April 2012

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Website: www.ijirset.com

Vol. 6, Issue 5, May 2017

- [4] Ms. Monal Giradkar, Dr. Milind Khanapurkar: Design & Implementation of Adaptive Front Light System of Vehicle Using FPGA Based LIN Controller. 2011 Fourth International Conference on Emerging Trends in Engineering & Technology Brazil, 2011, pp. 121–135.
- [5] Qiangsheng Ye: Research and Application of CAN and LIN Bus in Automobile Network System, 2010 3rd International Conference on Advanced Computer Theory and Engineering, China, p. 115-134, 2010. 1602
- [6] Alexandre Campos “omnibus interior lighting system using leds and automotive communication network” Vol. 17 no. 2/Abril, Maio e Junho 2006 205
- [7] K Murilo Cervi, Douglas Pappis and Tiago Banderia Marchesan: A Semiconductor Lighting System Controlled through a LIN Network to Automotive Application. 0-7803-9208-6/05/2005 IEEE.