



A REVIEW PAPER ON SMART HEADLIGHT AND THROTTLE CONTROL SYSTEM IN AUTOMOBILE

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Abstract: Nowadays the automotive physical science plays important role within the industry. This paper represents an intelligent way of enhancing safety of an automobile by integrating multiple features. The necessary of this paper two option area unit introduced in one system. The front wheel of steering mechanism with transportable headlights with latest technology and Throttle by wire is that necessary technique underneath Drive by Wire. It plays important role in emission, control, Safety of automobiles .It's appearance easy downside however position management of the throttle valve quite troublesome thanks to its application constraints and system characteristics. It's application of control system.

Index Terms : literature Review on throttle control and headlight safety system in automobile, comparative study with existing systems.

I. INTRODUCTION

In an automobile field vehicular automation involves use of mechatronics, artificial intelligence system to assist a vehicular operator. Recent years in automotive environment there are tremendous research and various kind of designs are implemented for our safety. New features and vehicle employing them may be labeled as intelligent or smart system.

There is a system developed for the throttle body automation in automobile. Throttle body is may be a part of the air intake system and positioned between the air intake hose and therefore the manifold. Now a days, multiple throttle body is employed in automobile for fuel transfer into the cylinder at once interval of the throttle. Earlier, vehicles accustomed be equipped with single throttle body. In a very throttle body style, air rushes into the intake manifold's plenum once the throttle is opened however there was the delay interval that have an effect on the performance of the vehicle. Therefore throttle body upgradation comes in automotive atmosphere. Throttle body plays a crucial role in automobile for management speed and power. Automotive throttle body associate in nursing witness the numerous growth, increasing demand for cars in developing region and conjointly upgradation in throttle body facilitate to extend sales of automobiles.

One more upgradation introduced during paper that is Smart Headlight system which is helps to enhance driver safety whereas driving vehicle in dark night. Smart headlight that's helps to reduce scale back accidental rate which are happened in night. Smart headlight are supported steering control system technique. There are cars that have their headlights directly connected to the steering mechanism so that its lights can follow the movement of the front wheels.

The goal of this technique is introducing new techniques for safety of driver and additionally engine quality with upgraded system. There are various existing system obtainable in automobile surrounding.

Throttle by wire:

- The throttle cable nearly become redundant on today's automobile. The drive-by-wire system is by no means that a fresh construct as a result of it had been introduced by BMW on their 7seven series range vary back in 1988. The system BMW use is cited to as EML (German term for electronic throttle control). The system has presently found its manner onto various vehicles with humbler routes and may be found on aboard models. Historically a mechanical linkage between the foot pedal and also the throttle butterfly has constantly existed, be it via a cable or via rods and linkages. These have presently been replaced by refined electronic management modules, sensors and actuators. This system is addition cited 'Fly-by-Wire'.

Smart headlight system:

- Number of techniques are Vehicle headlights high beam cause's danger during night time because most of the drivers use high beams during driving. This causes a glare effect to the driver in the opposite direction for a short period of time. This leads to accidents and another problem during night times is the wastage of power in streets since continuously the street lights are turned ON. This may generates a power crisis for future generation.

Problem Defined:

The general problem is to design a system which is simple to implement in automobile. Its help to maintain engine operation, speed and power. Substantially improve safety and comfort for road users in night time. The main goal of this proposed project to discuss ways in which present, static vehicle illumination systems could be improved by making them dynamic more adaptable to the ever changing road conditions.

II. LITERATURE REVIEW

Although various automobile manufacturers are currently working on the Throttle by wire and steering control headlight system . The solution is not readily available in Indian Market. Numerous techniques are have been proposed and a dense literature is available on throttle by wire and adaptive headlight.

Rohit B. Jadhav , S.G.Tahmnakar , Pravin Kamble[1] Proposed system is embedded environment in automobile for throttle by wire with help of close loop system and also use of Arduino, PID controller, this techniques introduced proper function of engine which controls torque and acceleration of vehicle. Result of the system are obtained using certain value of the throttle performance by certain values of PID gains.

Saiful A. Zulkii [2] and his colleague proposed that electro mechanical device controlled electronically by power transistors. Coupled with accelerator pedal and built in Position sensor, the system is referred as electronic Throttle by Wire (TBW).

Manisha V Makwana1a [3] and his colleagues paper presents on the hardware of movable Headlight System for motor vehicles Headlight System is an active safety system, where the head lamp orientation control system rotates the right and left headlights independently and keeps the beam as parallel to the curved road as possible to provide better night time visibility to driver. In this system use rack and pinion arrangement which give drive to the optical axes on which headlight are mounted so when a tie rod arms are moved with steering arm that give predefined motion to the wheel as well as headlights.

Kobayashi,[4] discussed the new standard for cornering light system allows not only the conventionally approved ON-OFF control mode interlocked with operation of the turn signal switch but also an automatic ONOFF control according to steering wheel angle. The active cornering light system (ACL System) on the new DELICA D:5 have a dedicated ECU to control the operation of lamps. In addition, the light distribution of the ACL System is co-ordinated with that of the high intensity discharge headlights to offer higher night time visibility of road shoulders at intersections. In recent years, global harmonization of automotive regulations has led to changes in Japanese vehicle equipment and design. This paper also introduced change in regulatory requirements regarding lighting equipments and the accommodation of such changes by the vehicle design. [1] Chi on-Dong lin, proposed by car light piloting system objective of the present invention is to provide a steering wheel controlled car light piloting system which automatically turns the lights of the motor car to coincide the projections of the lights with the steering direction of the motor car. The present invention comprises an electric contact mechanism consisted of electric brushes and metal contacts dispose around the steering coloumn of the steering wheel of a motor car, a motor drive consisted of at least one servomotor, a control circuit connected between the motor drive and the electric contact mechanism to control the revolving direction to the turning direction of the steering wheel, and a transmission mechanism consisted of at least one hydraulic cylinder systems and controlled by the motor drive to turn the light of motor car causing them to coincide with the steering direction of the motor car

Hiroaki Okuchi, [5] proposed automatic optical axis adjusting device for automatically adjusting direction of optical axes of front lights with respect to steering angle of steering wheel. An electronic control for automobile headlight using spherical sensor comprised of a metal ball surrounding by a fluid encapsulated in a spherical sensor which is connected to the spherical sensor system. Computer controlled unit is positioned on and close behind the headlight so that the metal ball cooperate with sensor within the spherical sensor system to make the headlight go so as to follow the car during turns.

Heather Steiner brown [6] presented paper on electric control for automobile headlights output of each sensor arrangement is supplied to an ECU through a communication bus line. A value of a turning radius of a vehicle which is used for adjusting direction of optical axes of swivel lights is 12 computed based on the output of each sensor arrangement is obtained. An optical axis control angle is computed based on the normal computed values and is used to drive actuators to adjust the direction of the optical axes of the swivel lights.

Ken Chi Nishimura, [7] suggested that the apparatus for automatically adjusting a direction of a light axis of the vehicle headlight includes a steering angle sensor detecting a steering angle of steering wheel of a vehicle and swivel control unit performing swivel control by which the direction of the light axis of the vehicle headlight is adjusted to the target directioning accordance with the steering angle detected by steering angle sensor. The swivel control unit varies sensitivity or responsiveness of the swivel control depending on a value of steering angle detected by the steering angle sensor. The direction of the optical axis of each swivel light is adjusted based on a swivel control angle obtained upon the application of filter. A filter is changed to change a response in swivel adjustment of a direction of an optical axis of each swivel light based on steering angle variation of a steering angle of steering wheel measured with a steering angle sensor.

Masonori Kondo,[8]suggested the automatic optical axis adjusting device for automatically adjusting direction of optical axis of from lights headlight control apparatus and method controls an irradiation direction of headlight. This apparatus uses a navigation based swivel angle calculated based upon the shape of a road in a navigation based control period and a steering based swivel angle calculated based upon a steering angle in a steering based control period. When the control period to the steering based control period this apparatus uses a value between the navigation based swivel angle and the steering based swivel angle as a present control swivel angle for controlling the irradiation direction of the headlight.

T. Hacbekir [9] and his colleague presents the hardware in the loop simulation of an Adaptive Headlight System for motor vehicles. The Adaptive Headlight System is an active safety system, where the headlamp orientation control system rotates the right and left low beam headlights independently and keeps the beam as parallel to the curved road as possible to provide better night time visibility.

Dr. Ashok Sutagundar, Basamma Patil, Srinidhi K S, Yashonidhi Yajaman,[10] presents Adaptive headlights are an active safety feature designed to make driving at night or in low-light conditions safer by increasing visibility around curves and over hills.

B. Ashok, S. Denis Ashok *, C. Ramesh Kumar [11] presents Trends and future perspectives of electronic throttle control system in a spark ignition engine.

Alessandro Beghi [12] and his colleague develop unique approach for problem of designing a drive by-wire throttle control system for a high performance motorcycle by feedback controller engine is considered.

Arvind Goyal [13] and his colleague gives an overview of Drive by Wire Technology for Automobiles.

Vijay Mandal, Vellington Roy Deepak Chandra' Shubham Yadu Jitendra Yadav [14] presents condition, highest fatal road accident occurs during night time. In most cases, late identification of upcoming objects becomes the main cause. These conditions gives the forward headlight systems a key role in automobile.

J.B. Jiang, C.F. Cheung, S.To, K.W. Cheng, H. Wang, and W.B. Lee [15] "Design and fabrication of freeform reflector for automotive headlamp" 2nd International Conference on Power Electronics Systems and Applications: Hong Kong, 12-14 November 2006, p. 220-224.

Manisha V Makwana¹a, Akshay Shah²a Shankar Rahul³a and Ajay Patel⁴, [16] Design and Manufacture of Movable Headlight System in Automobile, International Journal of Innovative and Emerging Research in engineering,2014,12-16.

N.Laxmi, B.Anil Kumar, D.kiran varma,[17] Design and Fabrication of A Steering Controlled Headlights in Automobile, International Journal & Magazine of Engineering, Technology, Management and Research, July 2015,98-102. [4] Fundamentals.

IV.CONCLUSION AND FUTURE WORK

Before we undertook this project our knowledge about directional headlights and throttle by wire was limited. After doing an extensive research for this project we have a wider knowledge of this field in automotive technology, learnt useful information about different types of headlights and control system for throttle valve. We have searched the library of the college for relevant books and the internet for additional information. During the build of an experimental model of steering control headlights and throttle control on a vehicle we have improved our DIY skills and technical problem solving ability. So our proposed system introduce new technique that is very easy to understand, easy to implement with less number of hardware.

V. REFERENCES

- [1] Throttle by Wire using Embedded Environment Rohit B. Jadhav , S.G.Tahmnakar , Pravin Kamble, PG Student, Dept. of Electronics, Walchand College of Engineering, Sangli, India1 Assistant Professor, Dept. of Electronics, Walchand College of Engineering, Sangli, India PG Student, Dept. of Electronics, Walchand College of Engineering, Sangli, India 3
- [2] Saiful A. Zulkifli, V.S.Asirvadam, and Nordin Shad. "Implementation of Electronic Throttle by wire for Hybrid electric Vehicle using National Instrument's Compact RIO and Labview Real Time." 2014 IEEE.
- [3] Design and Manufacture of Movable Headligh System in Automobile Manisha V Makwana¹a, Akshay Shah²aShankar Rahul³a and Ajay Patel⁴b,Assistant Professor 1, Mehanical Engineering Dept. A.D.I.T College,rathodmanisha16@yahoo.comaBE Scholar 2, Mehanical Engineering Dept. A.D.I.T College, akshayshah0013@gmail.comaBE Scholar 3, MehanicalEngineering Dept. A.D.I.T College, shr.rahul11@gmail.comAssociate Professor 4, Mechatronics Engineering Dept.,GCET, Vallabh Vidyanagar, ajaypatel@gcet.ac.in
- [4] Shreyas S1, Kirthanaa Raghuraman1, Padmavathy AP1, S Arun Prasad2, G.Devaradjane3Madras Institute of Technology, Anna University Chennai, Adaptive Headlight System for Accident Prevention, April 2014.
- [5] Jiae Youn, Meng Di Yin, Jeonghun Cho, and Daejin Park*School of Electronics Engineering, Kyungpook National University Daehakro, Bukgu, Daegu, 702-701, Republic of Korea boltanut@knu.ac.kr Jiae youn,Meng Di Yin.
- [6] Jyotiraman De 2014 IEEE International Conference on Vehicular Electronics and Safety (ICVES) December 16-17, 2014. Hyderabad, India, UNIVERSAL ADAPTIVE HEADLIGHT SYSTEM [6] Design Of Machine Element, V.B. Bhandari, R. S. Khurmi.
- [7] Pengfei Song, Yang Zhang, Xianglong Wu and Yufan LanSchool of Instrument Science and Opto-electronics Engineering Hefei University of Technology Hefei, China, Design and Implementation of the Adaptive Control System for Automotive Headlights Based on CAN/LIN Network, 2013
- [8] Ms. Monal Giradkar and Dr. Milind Khanapurkar, "Design & Implementation of Adaptive Front Light Systems of Vehicle Using FPGA based Lin Controller", 2011 Forth International Conference on Emerging Trends in Engineering & Technology.

- [8] Design Of Machine Element, V.B. Bhandari, R. S. Khurmi.
- [9] A Textbook Of Workshop Technology ([10] Yali Guo, Qinmu Wu And Honglei Wang, "Design and Implementation of Intelligent Headlamps Control System based on CAN Bus", 2012 International Conference on Systems and Informatics(ICSAC2012).
- [11] Takeshi Taoka, Makato Manabe And Mashiro Fukui, "An Efficient Curvature Lane Recognition Algorithm by Piecewise Linear Approach". [6] Fengqun Guo, Hui Xiao, Shouzhi Tang, "Research of Modeling and Simulation on Adaptive Front Lighting System for Corner based on CCD", 25th Chinese Control And Decision Conference (CCDC), 2013
- [12] A Textbook Of Workshop Technology (Manufacturing Processes), R.S. Khurmi, J.K. Gupta.
- [13] <https://www.youtube.com/watch?v=C9jBV>
- [14] Automobile Engineering vol-i by dr. Kirpal singh.standard publishers distributors.
- [15] Theory of machines by R.S khurmi & j.k gupta s.chand & company ltd. new delhi.
- [16] Automobile engineering by R.B gupta .
- [17] G.B.S.narang, automobile engineering khanna publishers, delhi. 1991, pp671.
- [18] Automobile Engineering William Crouse. 6. Automobile engineering, K.K ramalingam, scitech pub.
- [19] Alexander, G. J. and Lunenfeld, H. (1990), "A users' SA-90-017, U.S. Department of Transportation, Federal Highway Administration, Washington, DC pp. 1-39.
- [20] D. Neunzig and R. Lachmayer, "Lighting and Driver Worldwide 6/2002, Vol. 104, pp 13-17.
- [21] Japanese Patent Application Laid-Open No. H8-192674.



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V.REFERENCES

- [1] Throttle by Wire using Embedded Environment Rohit B. Jadhav , S.G.Tahmnakar , Pravin Kamble, PG Student, Dept. of Electronics, Walchand College of Engineering, Sangli, India1 Assistant Professor, Dept. of Electronics, Walchand College of Engineering, Sangli, India PG Student, Dept. of Electronics, Walchand College of Engineering, Sangli, India 3
- [2] Saiful A. Zulkifli, V.S.Asirvadam, and Nordin Shad. "Implementation of Electronic Throttle by wire for Hybrid electric Vehicle using National Instrument's Compact RIO and Labview Real Time." 2014 IEEE.
- [3] Design and Manufacture of Movable Headligh System in Automobile Manisha V Makwana1a, Akshay Shah2aShankar Rahul3aand Ajay M Patel4baAssistant Professor 1, Mechanical Engineering Dept. A.D.I.T College,rathodmanisha16@yahoo.comaBE Scholar 2, Mechanical Engineering Dept. A.D.I.T College, akshayshah0013@gmail.comaBE Scholar 3, MechanicalEngineering Dept. A.D.I.T College, shr.rahu11@gmail.comAssociate Professor 4, Mechatronics Engineering Dept.,GCET, Vallabh Vidyanagar, ajaypatel@gcet.ac.in
- [4] Shreyas S1, Kirthanaa Raghuraman1, Padmavathy AP1, S Arun Prasad2, G.Devaradjane3Madras Institute of Technology, Anna University Chennai, Adaptive Headlight System for Accident Prevention, April 2014.
- [5] Jiae Youn, Meng Di Yin, Jeonghun Cho, and Daejin Park*School of Electronics Engineering, Kyungpook National University Daehakro, Bukgu, Daegu, 702-701, Republic of Korea boltanut@knu.ac.kr Jiae youn,Meng Di Yin.
- [6] Jyotiraman De 2014 IEEE International Conference on Vehicular Electronics and Safety (ICVES) December 16-17, 2014. Hyderabad, India, UNIVERSAL ADAPTIVE HEADLIGHT SYSTEM [6] Design Of Machine Element, V.B. Bhandari, R. S. Khurmi.
- [7] Pengfei Song, Yang Zhang, Xianglong Wu and Yufan LanSchool of Instrument Science and Opto-electronics Engineering Hefei University of Technology Hefei, China, Design and Implementation of the Adaptive Control System for Automotive Headlights Based on CAN/LIN Network, 2013
- [8] Ms. Monal Giradkar and Dr. Milind Khanapurkar, "Design & Implementation of Adaptive Front Light Systems of Vehicle Using FPGA based Lin Controller", 2011 Forth International Conference on Emerging Trends in Engineering & Technology.
- [8] Design Of Machine Element, V.B. Bhandari, R. S. Khurmi.
- [9] A Textbook Of Workshop Technology ([10] Yali Guo, Qinmu Wu And Honglei Wang, " Design and Implementation of Intelligent Headlamps Control System based on CAN Bus", 2012 International Conference on Systems and Informatics(ICSAT2012).
- [11] Takeshi Taoka, Makato Manabe And Mashiro Fukui, " An Efficient Curvature Lane Recognition Algorithm by Piecewise Linear Approach". [6] Fengqun Guo, Hui Xiao, Shouzhi Tang, "Research of Modeling and Simulation on Adaptive Front Lighting System for Corner based on CCD", 25th Chinese Control And Decision Conference (CCDC), 2013
- [12] A Textbook Of Workshop Technology (Manufacturing Processes), R.S. Khurmi, J.K. Gupta.
- [13] <https://www.youtube.com/watch?v=C9jBV>
- [14] Automobile Engineering vol-i by dr. Kirpal singh.standard publishers distributors.
- [15] Theory of machines by R.S khurmi & j.k gupta s.chand & company ltd. new delhi.
- [16] Automobile engineering by R.B gupta .
- [17] G.B.S.narang, automobile engineering khanna publishers, delhi. 1991, pp671.

[18] Automobile Engineering William Crouse. 6. Automobile engineering, K.K ramalingam, scitech pub.

[19] Alexander, G. J. and Lunenfeld, H. (1990), "A users' SA-90-017, U.S. Department of Transportation, Federal Highway Administration, Washington, DC pp. 1-39.

guide to positive guidance, third ed.," Report No. FHWA-

[20] D. Neunzig and R. Lachmayer, "Lighting and Driver Worldwide 6/2002, Vol. 104, pp 13-17.

Assistances Systems for Improving Vehicle Safety," ATZ

[21] Japanese Patent Application Laid-Open No. H8-192674.

