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INTELLIGENT NIGHT VISION SYSTEM FOR AUTOMOBILE BASED ON COMPUTER VISION- A REVIEW

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ABSTRACT:

No one in this world is willing to face the accidents while travelling, human safety is really important and hence to avoiding the accidents is also essential. It is found in study that most of the accidents occurred all over the world are due to insufficient night vision. The accidents may damage the automobile and human life is in danger as well. Many researchers and R&D organisations have suggested the changes in the design of vehicles from safety point of view. In the era of smart world, it is need of time to, design and implement the smart night vision system for automobiles. Authors have proposed the intelligent night vision system for automobiles based on computer vision in this paper.

Keywords: Sensors, Controllers, computer vision, night vision system.

INTRODUCTION:

Consideration of the accidents occurred during last few decades have made it mandatory to prepare and follow the safety ratings for automobiles. Every vehicle manufacturers have to mention the star rating of safety arrangements provided in the vehicle. The safety ratings are published by using the rating system of one to five stars. This system is defined by consideration of safety provided, the impact during the event of crash and the technology used in the vehicle to avoid crash. To insure the safety and providing the highest safety is the challenge and priority of R&D engineers now a days. People are ready to pay more for safety and comfortable driving conditions in vehicles. For the night driving on highways, it is necessary to have head light beam of high density so as to provide better vision up to sufficient distance. The number of vehicle on road is continuously increasing everyday and hence manufacturers are forced to address the problems with safety. The use of electronic equipments and the modern technology finds application in this regards.

While driving on highways in night, the vehicles coming from opposite direction creates distraction to driving person by means of glare. This dazzle effect is one of the major problems faced by a driver in night driving. Most of the times it has observed that many drivers are not properly using dimmer light during night. By considering all these problems authors have addressed the problems and provided solutions in proposed system i. e. A. reducing the glare of headlight of oncoming vehicle [1]. B. Avoids accidents which happen on curved road, due to wrong direction of headlight [2-4]. C. Automatic movement of Headlight with the steering.

LITERATURE REVIEW:

With respect to said work an extensive literature survey conducted accordingly which is

Tsz-Ho Yu,Yiu-Sang Moon have implemented the intelligent night vision system for vehicles by using camera and computer vision system. The arrangement in the proposed system is found useful from safety point of view. It is convenient to use for night driving and provides features like zooming, Spotlight projection, and road sign detection. It provides the complete information about the object present on road. [1]

Meftah Hrairi and Anwar B. Abu Bakar have found that the highest numbers of accidents occurred on curved roads. The main cause of the accidents is late recognisation of object. In this paper authors have implemented steerable headlights by adapting conventional static headlamp. The implemented system is found reliable and cost effective. The components used are very easily available in the market. Authors have performed various tests on the designed system to examine its performance and response and system impact. [2]

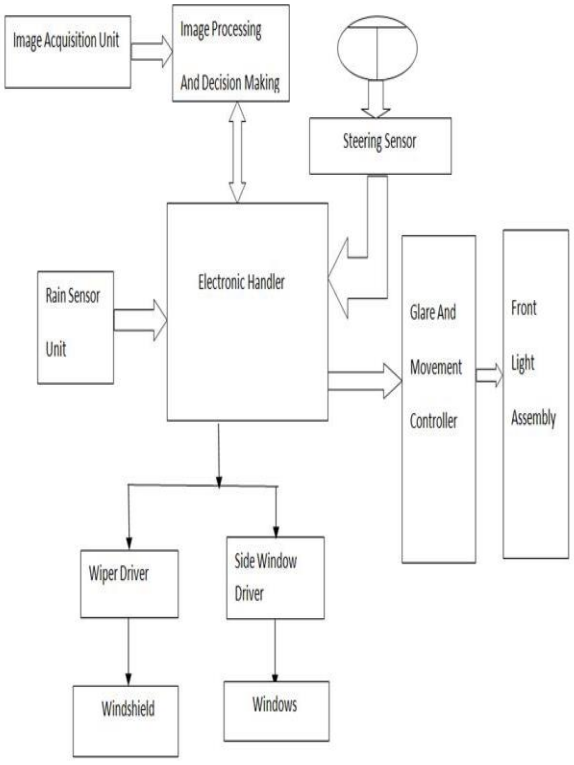
Prajkta vikas Adhav, Prof.S.A.Shaikh have analysed performance of the vehicle at corner. Authors have found that, when a motor turns, the headlamps will also turn with vehicle body. Due to this the illumination is less. The authors have proposed the adapting front system based on charge coupled device i.e. CCD. The main aim of this system is on curvature road in order to adjust

turning angle and steering accordingly. The system used has image sensor and servomotors to adjust the headlamp. It gives real time information of curved roads. [3]

Prateek Khurana, Rajat Arora, Manoj Kr-Khurana has proposed the Electronic Stability Control (ESC) system. The system is effectively suitable for the situations where driver looses traction.ECS system prevents the vehicles from turning over and avoids accidents at high speed. Here the headlamps are turned with turning direction of vehicle. The microcontroller bases system provides inputs to ECS. The whole system may be fabricated onto single IC& can be installed in four wheeler drive commercial vehicle with a brake force distribution system. [4]

Hiddeki Kajioka & Keiji Fujimura has developed optical automatic windshield wiper control which is improved version of intermittent wiper systems. It reduces bulky wiper operation and improves driver's level of comfort. Drivers comfort level is important for safety and [5]

PROPOSED WORK:



METHODOLOGY OF IMPLEMENTATION:

Study on accident data proves that, highest number of accident occurred at curved road during night time. The conventional headlights are not safe due to low illumination. At the same time high intensity beam focused directly on line of sight of opposite driver increases chances of accidents.

Considering all above things it is really needed to design and implement new technologies or make effective use of present technologies is important to improve visibility for driver at night time during curve road and to reduce glare of the front lights. The proposed system mainly consisting 3 systems which are mentioned below and better than traditional front lighting system.

1 Canny Front lighted Autofocus [1]
2. Electronic Handler for lamps like a pair of eyeballs [2-4]
3. Sensor driven Side windows And Wiper [5]

1. CANNY FRONT LIGHTED AUTOFOCUS:

On the basis of statistics of accident data, most accident are occur at the night time so that it is a great importance to use available technology to contribute to road safety by improving the visual condition provided by vehicle headlight. The focus of proposed method is to reduce the reaction time of the driver by improving visibility and achieve a significant increase in road safety and driving comfort.

Headlights are having two beams called low and high are used which have different purpose during night ride. Position of low beam is fixed to have proper visibility during night while the glare of high beam changes when oncoming vehicle detected. Detection of oncoming vehicle will be done with the help of sensor unit fixed at the centre of the vehicle that consequently reduces glare of the headlights.

2. ELECTRONIC HANDLER FOR LAMPS LIKE A PAIR OF EYEBALLS:

Electronics Handler System is a system where the headlamp orientation system rotates the right and left beam headlights and keeps the beam as parallel to the curved path as possible as to provide better night time visibility with the change in steering angle. Steering system is mainly composed of steering wheel rotation sensors, electronic control unit (ECU), motor drive circuit, motors and so on.

The basic idea behind adaptive lighting is to turn and aim the headlights like a pair of eyeballs so the light is projected where the driver really needs it. Inputs from

the steering are used to steer the headlights from side to side as the vehicle turns.

3. SENSOR DRIVEN SIDE WINDOWS AND WIPER:

Driver feels discomfort while driving in rainy and snowy conditions in addition to that driver has to operate wipers manually. This system comprises of existing wiper system with sensor and controller unit. As soon as raindrop falls on sensor board control unit triggers wiper system. This technology also proposes automatic operating of side windows while driving in rainy conditions.

B) OBJECTIVES:

Canny Front lighted Autofocus
2. Electronic Handler for lamps like a pair of eyeballs
3. Sensor driven Side windows And Wiper

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