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SAFE DRIVE ANTIGLARE SYSTEM FOR AUTOMOBILE HEADLIGHTS Karthick G, Department of electrical and electronics engineering, Amrita school of engineering, Ettimadai, Coimbatore – 641112. gkarthick.ecp@gmail.com Aravind E, Department of electrical and electronics engineering, Amrita school of engineering, Ettimadai, Coimbatore – 641112. aravind.elango1995@gmail.com Ramya Sundaram B, Department of electrical and electronics engineering, Amrita school of engineering, Ettimadai, Coimbatore -641112. ramsunpower@gmail.com Harithaa S, Department of electrical and electronics engineering, Amrita school of engineering, Ettimadai, Coimbatore – 641112, harithaa16@gmail.com Shriram K Vasudevan, Department of computer science engineering, Amrita school of engineering, Ettimadai, Coimbatore -641112. shriramkv@gmail.com ABSTRACT In recent years, headlight glare poses serious risk to the oncoming drivers, including increased risks to the drivers on a two-lane highway. The glare emitted from the headlights remains to be one of the most frequent complaints. With the automobile industry producing stunningly bright headlights, the situation has become even more adverse. Though high intensity of headlights may provide good visibility of the objects ahead, it also increases discomfort that the glare of the headlights may cause to drivers of other vehicles. As a result, many fatal accidents occur at night than during day time. The danger arises from the fact that the glare from the headlight of other vehicles may temporarily blind us, making us unaware of what is at the forefront. Thus it has become a necessity to minimise and manage the glare using specific approach. Thus the innovative headlight glare control system provides an efficient solution for these issues. INTRODUCTION In the current transportation system, most of the accidents occur during night. The blinding light in the windshield and rear-view mirror cause a great discomfort to the drivers during night time. The advent of sports utility vehicles and the high intensity discharge lamps, night time driving has turned into a potential hazard [1]. Driving at night is a difficult task because of poor visibility. A driver must have a watch over lane lines, traffic signs, pedestrians, animals, and other road abnormalities while driving. The overhead lighting can be used to provide improved visibility but it is expensive and can’t be relied upon. Hence only headlamps can be used. The headlight glare problem is represented in the figure 1. Figure 1 headlight glare problem Troxler effect is an optical illusion [5]. It is caused because of glare from the headlights in the retina of the drivers. It causes temporary blindness. It is also known as Troxler’s fading and it handicaps the driver for a few seconds when exposed to high intensity lights (greater than 10,000 lumens). Drivers who are exposed to high intensity lights are affected by Troxler effect. It causes diminished visibility. This forms a major cause of night time accidents. More than 40 percent of the accidents occur during night time. Most of these accidents are fatal. LITERATURE SURVEY For this project, many existing glare reduction

techniques were analysed. Techniques such as lighting using polarisation technology, glasses for night driving, and anti glare mirrors are used to limit the illumination reaching the drivers eyes. The use of ultraviolet headlights also reduces the effects of glare. The effects of glare can also be reduced by reducing the intensity of the headlamps and also by increasing the glare angle. It is not possible to terminate the glare problem by any one of the above counter steps without directly affecting the visibility of the driver [3]. More over the methods such as wearing polarised glasses just give the sensation of seeing better [4]. In reality, most of the methods affect the visibility. In few other techniques, the use of LCD displays and CMOS glare sensors [2] has been illustrated to reduce the illumination reaching the driver's eyes. But these methods are complicated and involve ponderous processes. High intensity discharge lamps produce extremely bright light that almost blinds the drivers of the vehicles coming in other direction. The adaptive head lights involve two sets of lights – high beam and low beam. The driver can adjust between these two beams with the help of a switch. Low beam is of low intensity and is used to see less range while high beam is of high intensity and is used to see long ranges. But most drivers fail to switch between the high and low beams in heavy traffic because of their negligence and thoughtlessness. So it would be better to have an automatic system in order to switch between the high and low states depending on the traffic and the surrounding illumination. Here, in our proposed solution we have implemented an automatic glare reduction technique with the help of light detecting resistor. PROPOSED SOLUTION Our proposed solution is easy for contrivance and is cheap. It can be implemented in all vehicles. Most of the circuit elements are basic electrical components and it have been chosen in such way so that it can be fabricated easily. The innovation here lies in the use of light detecting resistors and a processing unit for the switching of lights. The different components used in the architecture are discussed below. Light detecting resistors Light detecting resistors are also called as photo resistors. LDRs are variable resistors controlled by light. Here it is used as light detecting sensor in a light activated switching circuit. The resistance decreases as the light intensity increases. The light detecting resistors have a very high resistance. But, when it is illuminated with a light source, the resistance falls drastically allowing the current to flow through it. A simple light detecting resistor is shown in the figure 2. Figure 2 Light detecting resistor Central Processing Unit It consists of a processor and it is connected to a relay circuit. The central processing unit commences the processing of the software. The processor here sends the impulses to switch between the two modes of light. Transistor BJT commonly referred as a transistor is a three terminal device which involves the operation of holes and electrons. BJT has high output resistance and high transconductance. Because of these properties it has became a choice for our system. MOSFETs can also be used instead of BJTs. ARCHITECTURE Our purpose is to provide a shrewd solution for safe and comfort driving in night without any intense effects. It is an automated lighting System for Vehicles which eliminates the need of physical operation in turning different modes of light (Bright/Dim) when a vehicle approaches the other in opposite at night. The system developed here senses the light from the opposite vehicle, if any, it automatically changes its operation to dim mode and turns back to the bright as soon as the vehicle crosses it. The system developed makes use of a light dependent resistor (LDR) whose resistance decreases with increase in light intensity. Here we use comparator circuit designed with transistor, which compares the fixed resistance and the LDR resistance with reference to the ground. When two vehicles face oppositely, the beam of light from each vehicle falls on the opposite vehicles LDR. This light reduces the resistance of LDR and permits more current to pass through the base of the transistor. Considering the efficiency, more than one set of this system is placed in a vehicle. The transistor output of each set is connected to the processor. When one or more transistor starts conducting the processor connected to the transistor senses it and activates the relay circuit, which in turn flips the contacts such that the opposite light turns to the dim mode. It is easy to say that a driver can drive by tuning the light to dim mode. But when the vehicle is driven on the highways, it is required that light beam should be of high density and should illuminate the road at a distance sufficiently ahead. Another problem

is that driver would not be able to see the bumps in road in advance. So it may lead to caution. This system also provides a solution for the problems faced by the driver while driving under dim mode. This solution is based on edge detection technology. The representation of the architecture is shown in the figure 3. Figure 3 Architecture FUTURE DEVELOPMENTS This system can be further developed by placing a programmable headlight which makes use of camera, beam splitter and a processor. The camera here captures the vehicle from which the light is illuminated. This image is processed in processor and the light beam is controlled in such a way it does not affect the opposite driver. This light beam gets split by the beam splitter so that it makes no glare. In poor weather condition the light should penetrate the snow. In such cases the programmable headlight are mostly preferred to the normal ones which eliminates the need for external system for extreme brightness to penetrate snow. TECHNICAL HINDRANCES The greatest hindrance in the proposed solution is the sensitivity of the LDRs.LDR should be sensitive enough to detect the light from the opposite vehicles. At the same time, it must not be reacting to the illumination from the billboards. Further the light detecting resistor must be further secured from environmental factors such as dirt, filth, water etc. the system must also be provided with a continual electrical supply. The system must also be positioned in such a way that it

1**is in the line of sight** of **the** driver. CONCLUSION **Glare**

poses a serious threat for a driver which causes a discomfort while driving. This has formed a reason for innumerable number of accidents. These accidents due to glare can be reduced to a great extent by switching the headlamps between high and low beam. With the implementation of our proposed system it will not only provide a safe driving experience but will also bring down the rate of accidents. There is also a further scope for development which would make roads a much safer place to drive. REFERENCES [1]. S.Aishwarya, Bright Headlights a major cause of accidents, The Hindu, Online edition, May 02,2006. [2]. K. Bhagavathula, A. H. Titus, and C. Mullin, “An Extremely Low-Power CMOS Glare Sensor,” IEEE Sensors Journal, vol. 7, pp. 1145-1151, 2007. [3].

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