IOT BASED AUTOMATIC DIMMER FOR ACCIDENT AVOIDANCE

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ABSTRACT

This paper mentions the study in the topic of safety in the car industry. Since head light is the most vital in night trains, but up as high as required, head light intensity should be taken by vehicle, which is not accessible in cars as sunlight. In this work, Arduino, sensors, LEDs and other accessories are used to produce the prototype headlight system. A multi-function headlights prototype enables, turns off the headlight in bad weather situations and allows automatic headlight conversion from low to high intensity beams. This model also eliminates the driver's manual switch necessity because automated switching takes occur. This type combined three separate characteristics of the headlight system. These include automatic start of headlight at night, automated light intensity adjustment for the opposite beam and automatic switch ON when the weather is damp. In the automotive industry, which offers driver driving safety, this approach is particularly important. The work suggested comprises the automated image analysis indicator on and off.

Keywords—Arduino, LED, Sensors, Image processing, Indicator.

1. INTRODUCTION

When driving a vehicle, head lamping must be activated before sundown, and after sunrise turns off, depending to the light intensity and any other time under bad light circumstances such as fog, snow and rain. Even during the night, more than half of accidents happen with less road traffic since lightning is a significant problem that has increased in public awareness in the last decade. As a blinding effect, the high beam of the headlight of a coming vehicle and the visibility during the night driving is risky.

Most drivers utilise light beams while night driving. The individual driving from the other way is therefore uncomfortable. For a brief amount of time, it induces abrupt blink. This is due to the great intensity of lights from the other car from the other direction to him. Glaring causes a person to be temporarily blind throughout the night leading to traffic accidents. In view of this, the headlamp dim to minimise glare is designed to produce the prototype of the headlight system. In another situation, the driver can't see the road or motor in thick fog or moisture in the environment; more an accident happens since our vehicle's lights are very intensive at that time. This is also taken into account in the project work.

During night travel and diverse conditions, the demand of headlights is extremely prevalent. The same headlight that enables the motorist to see better during the night also causes many accidents. The driver is able to change the headlight from high beam (bright) to low beam (dim). The headlight must be adjusted by the driver in line with the light need. The development of this prototype minimizes this difficulty by lowering our car's luminous headlight automatically to its low ray when it senses a vehicle approaching from the opposite direction in close proximity. The whole operation of the dimmer is a simple electrical system constructed by the Arduino sensor that senses and turns the headlight on the necessary conditions [1]. Multi-function headlight system is developed in this prototype. Automatic ON and OFF switch is included to this job. It is also possible to transform light from bright light to light from different directions depending to the strength of light of cars. The Moisture Sensor is used to detect moisture in the ambient; brilliant light automatically switches on depending on the light

intensity. The produced prototype avoids this difficulty by automatically reducing the light of our car's headlight into a low beam, when a car senses near proximity from the opposite way. Image processing plays the major role in the automatic indicator on and off processing.

The work's goals as follows. Develop a prototype of an automated headlamp switch ON and OFF during light intensity driving.

ii. Transformation of luminous light from opposing directions into dull light by light intensity in vehicles.

iii. Turn the headlight automatically in the environment by measuring humidity/moisture level.

iv. Create automated headlight system prototype which combines all aspects mentioned.

v. Automatic on/off side indicators using image processing techniques.

• LITERATURE REVIEW

Reputed journals and publications are reviewed to remove progress in car safety and contributing to the safety of automobiles in terms of headlights. Their participation and input to safety w. r. r. head light are understood.

Drivers face a big trouble because of this bright beam light that falls on their eyes right from the arrival of the car. Many medical facts support your night driving issues. When a person falls in the strong light from the front of the car, it shines a set period of time. This leads the motorist to get disoriented. This creates driver discomfort, leading to driver closure.For some length of time, eyes. This is the distraction.Much road accidents are the major reason. In the field of medicine, Because the light shines on the driver's eyes, it generates Temporary blindness is called Troxler for the driver Eff. [1] Effect. The so called fading effect is well recognised. A study demonstrates that we suffer a glare when our eyes are exposed to an extremely bright source of roughly 10,000 lumens[2] This blindness is caused by exposure and cones in our eyes.

Even when the source of blindness is eliminated, the picture following the blind spot remains in our sight. The Troxler effect is this phenomena. Due to the Troxler effect, there are frequent mishaps. This is more than plenty for a traffic calamity. This impact of Troxler is every age. This Troxler effect is experienced by everyone who is exposed to unexpected light[3]. ARDUNIO, LDR (Light Dependent Resistor), Two Resistors (1K and 5K), LED (Red & Green), SENSOR (Humidity Sensor) etc. are the most often utilised parts of the circuit. The work was done by Murlikrishnan [4] Driving at night is a major risk for car headlights. Most drivers use strong and bright beams at night when driving. The individual who travels in the other way is therefore uncomfortable. For a brief length of time, he experienced a startling glare. This is due to the powerful headlight beam coming from the other car from the other direction. The headlight was supposed to fade in order to avoid the glow. This glare leads a person to become temporarily blind throughout the day and causes traffic accidents. We have created a prototype automated headlight dimmer to prevent these situations.

This lowers the high beam automatically to a low beam, lowering the lighting effect by sensing the car. It also avoids the need for manual driver swapping, which is not always done.

This article discusses in depth the construction, operation and advantages of the prototype model.

The car's headlights have been noticed by the researchers Robert Tamburo1, Eriko Nurvitadhi2, Abhishek Chugh1, MeiChen2, Anthony Rowe1, Takeo Kanade1, SrinivasaG. Narasimhan1 to increase safety in low light and bad weather. However, despite decades of improvements in light sources, even less traffic occurs at night in more than half incidents.

Their study presents a high-low latency visual system, which is able to immediately feel, react and adapt to anyone. Highway speeds moving surroundings. His only one variety of hardware design can be coded Tasks. - Tasks. High lights, better vision for the driver, Snowstorms, greater lane contrast, marking and Sidewalks and early visual obstacle warning are this study demonstrated.

The headlight light has expanded throughout the previous decade, as has been found in their research. Sushil Kumar Choudhary et al. The high lighting of an incoming automobile has an effect of dazzling and reduces visibility throughout the night. Most drivers use strong and bright beams at night when driving. These investigators believed this to be avoided by the faint illumination.

This glare leads a person to become temporarily blind throughout the day and causes traffic accidents. This model concept removes the need for a manual driver transition that is not always done. In the automotive industry, this approach is particularly beneficial.

• Methodology and exiperimental analysis

The circuit is a basic assemblage of regularly utilised circuit elements using Arduino in this exploratory inquiry. In this layout the layout is displayed, which consists of a separate PCB, LDR, RESISTOR, LED, SENSOR component.

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Fig 1 General structural diagram

The components were carefully and precisely selected so that the design is easy and straightforward to carry out. Figure 1 presents an overview of how equipment or points circuits are positioned.

Automatic night light control system does not require any manual action whether ON or OFF is required. Light. - Light. It senses whether or not light is necessary.

When darkness reaches a given value light is switched on automatically and if another light source, i.e. daytime, is found, the light is shut off.

In the project, we utilize an LDR for high or lower voltage sensor & Arduino to power the RELAY coil, which connects the control circuit with the external light source.

Specially light/dark sensor circuited light-dependent resistors are particularly handy. The resistance of an LDR is usually quite high, often up to 1000 000 Ohm, yet when They are substantially lighted by reductions in light resistance.

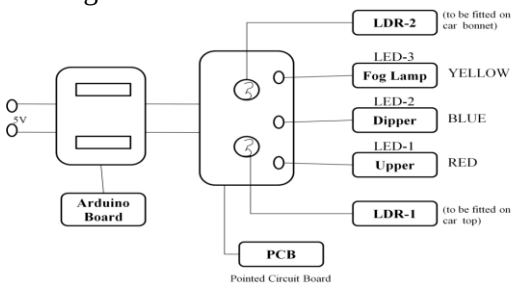

Fig 2 Circuit Diagram of Headlight Dimmer Unit

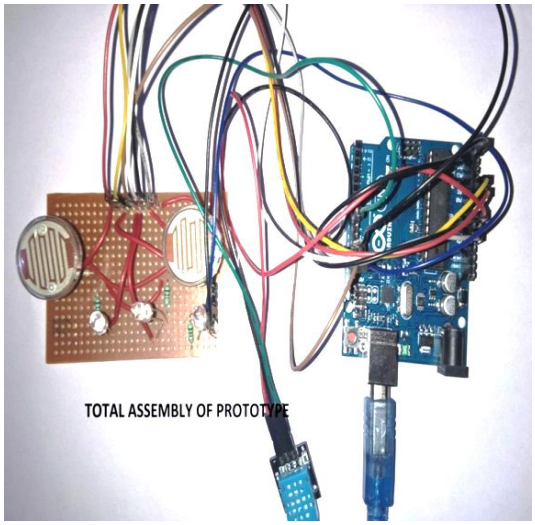

Fig 3a Total Assembly of Headlight Dimmer Prototype

The prototype assembly with connection may be shown in Figure 3, where Arduino PCB LDR connectivity etc. offers such parts as compiled in Figure 2.

Operation Principle This project operates on a vehicle's light intensity coming from other directions. In general, it's done automatically to modify the intensity of the vehicle and to decrease the intensity, i.e. dimming and luminosity. And the intensity of the vehicle is adjusted during fog. LDR 1, 2, 3 at higher, lower, and fog or under different weather situations, respectively.

In many of today's autos automatic headlights are a contemporary comfort. In most driving conditions, they eliminate the need to turn the driver on or off the headlights manually. Automated headlight names are different across automakers, but they provide the same driving function. The automatic headlamp option Set an automated headlights choice separate from the others for their supplementary characteristics. A photosensor which is inserted within the instrument panel activates the automated headlight. The sensor is situated under the defogger grill at the base of the windshield. The main understanding about the circuit's operation was grasped from the configuration in Fig 3.4. The LDR functions as a light and variable resistor sensor. Two LDRs, LDR 1 with the resistor (5k) and an LDR 2 with the resistor are linked (5k). The LDR, two resistors, form a potential network of splitters that determine the circuit current.

Fig 3b LDR unit in the prototype

The Arduino is a balanced network. The arduino board is linked with the LED's. The LED 1 is above. The LED 2 is more profound. The LED 3 is a fog-light. If LDR 1 falls with a high intensity, the entire circuit is closed and LED1 is disabled.

Circuit work

Basic automated headlights function by sensors that sense the amount of light out there. These sensors are generally situated on the car's dash. Sensors identify a particular degree of obscurity when the headlights turn on (darkness means the level of light). When the LDR falls, it passes by depending on the intensity of its current.

When the intensity is low, the current's flux is more resistant and when it is strong, the current flows through. We constructed the Arduino programme depending on the values supplied by the sensor, i.e. LDR, if the condition inside the programme is met by the programme then the output is made as LED. Take a look whether the car is black and moves around and crosses the car from the opposite side. As two distinct LDRs have been employed. LDR 1 is automatically switched off a second LDR system on principle, i.e., if natural light occurs (Day) then all of the system provides analogue signals if the light on this other LDR system is solved from the opposite vehicle. LED for lights switching.

The high light is going to be deeper. This automated headlight system will thus mainly be used to reduce glaring at night, which is caused by not utilising the deeper. What helps to prevent accidents? In this prototype, in the following circumstances, we constructed multi-functional headlight system.

Case 1- Automatic on and off switch when driving is introduced.

Case 2 - Conversion of light-to-light intensity in the opposite direction. Light intensity of vehicles.

In case 3- we utilize the humidity sensor to detect fog or humidity, light is automatically enabled according to the intensity of light.

The created prototype eliminates this difficulty by reducing the light headlight of our car automatically down to a low beam if you feel a car close to each other.

Automatic fog lighting is another aspect of the system. Visibility on the road is much lower when there is fog conditions. During driving the automobile we confront several problems. This method allows fog lights to be automatically activated when changes occur in the atmosphere, i.e. fog, heavy rain. In this we have employed the moisture sensor, which monitors the relative moisture and ambient temperature. If a particular level of moisture rises, it switches over the fog lighting.

- # Image processing for automatic side indicators

A parameter that governs the rate for adaption of the background employs an $\alpha = 1$ to 0 time constant. The binary mask has only 1 or 0 values. Regions containing value 1 indicate certain things which are given in the first picture. M is the frame sequence binary mask. Figure(a) is a picture of a random picture from the picture series and, after using an extensive Background Subtraction Method, it is the matching binary picture. Figure(b) Binary 1 region is the blobs found in Figure (a).

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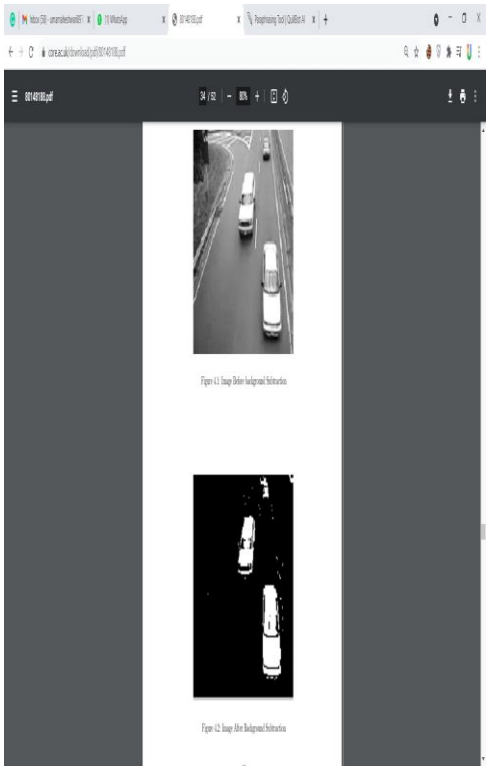

ALGORITHM FOR BACKGROUND SUBTRACTION BG-SUBTRACTION(Image)
Algorithm 1
REMOVE-PARTICLE(MASK) 1: [row col] ← SIZE(image) 2: For i ← 1 to row
3: For j ← 1 to col
4: Temp1 ← sign(B(i,j) - Temp(i,j))
5: End
6: End
7: For k ← 1 to nf-1
8: I ← frame k
9: threshold ← Temp1(i,j)+sign(N *sign(I(i,j)-Temp(i,j)))
10: For i ← 1 to row
11: For j ← 1 to row
12: if abs(I(i,j)-(Temp(i,j)+sign(I(i.j)-Temp(i,j)))) ≥ threshold Mask(i,j) ← 1 else Mask(i,j) ← {0 End
End

Removing Errors After background subtraction,

The next image sequence of the video we are left with the binary mask. The mask may contain some incorrect information, which might affect the camera's brightness or air pollution. As a stationary camera, this is not the cause of the issue. The brute force approach is used to eradicate these faults. The form and size of the things in the items are again being expanded by dilation. The largest value of a pixel of the 8 neighbouring pixels replaces the value of the pixel.

CONCLUSION

A simple and successful approach has been developed to address the topic under examination. Of course, the identification of automobiles in a mixing action is unambiguous, and the tallying computation is accurate. The limitation of the methodology is that a number of tuning settings are required to do the optimum execution for each camera data bolster. Moreover, it needs to be prepared under deeply intensive circumstances of activity. When humidity is more than 195 in the surroundings, the immediate fog lamp is activated. And if the humidity in the surroundings is lower, i.e. less than 195 it will be turned off, in another situation. All data above are extracted from the programme Arduino.

The exposure to a human eye with high luminous intensity is important and contributes to accidents in significant part. This is why an automated headlight dimmer has been researched and designed to decrease the risk of exposure. Every car must be fitted with the dimmer.

• Acknowledgement

The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g”. Avoid the stilted expression “one of us (R. B. G.) thanks ...”. Instead, try “R. B. G. thanks...”. Put sponsor acknowledgments in the unnumbered footnote on the first page.

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