Advanced Headlight Monitored and Collision Prevention System in Automobiles

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Abstract— This paper focuses on the design and working of Arduino based Adaptive Headlight System (AHS) for automobiles. The main purpose of this system is to Present a cost effective technique to illuminate blind spots while driving in the Night and during the times when the visibility is reduced significantly so as to make The objects visible in those darkened locations and there by prevent accidents. Vehicle technology has increased rapidly in recent years, particularly in relation to Braking systems and sensing systems. The wide spread introduction of anti-lock

Braking has provided the building blocks for a wide variety of braking control systems. In parallel to the development of braking technologies, sensors have been developed that are capable of detecting physical obstacles, other vehicles or pedestrian around the vehicle. This project focuses on building a user-friendly device that specializes in detecting intrusions besides doing closer an geobstacle detection. Automobile safety can be improved by anticipating a crash before it occurs and thereby providing additional time to deploy safety technologies. Warnings can be like buzzer if the driver is approaching a pothole or any obstruction, driver may be warned in advanced regarding what the road entails. The project's ultimate aim thus finalized as, one to build a general, easy-to-use and versatile system that can prevent fatal accidents.

KEYWORDS: Ardunio Microcontroller, Adaptive headlight system

I. INTRODUCTION

THE number of vehicles on our roads is burgeoning day by day. For this reason almost all the vehicle manufactures have to think about the extra safety Instruments and electronic controls to attach with these products for giving the users a safety. Modern automotive vehicles include a variety of different lamps to provide illumination under different operating conditions. Headlamps are typically controlled to alternately generate low beams and high beams .Low beams provide less illumination and are used at night to illuminate the forward path when other vehicles are present. High beams provide significantly more light and are used to illuminate the vehicle's forward path when other vehicles are not present.

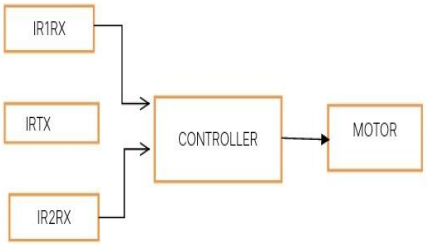
Daylight running lights have also begun to experience wide-spread acceptance. High beam are used for illuminating a road doesn't have very much traffic on it. By that way the driver can see further ahead for any road obstructions. High beam is also used when a driver is one an unfamiliar road and if there isn't much in the Way of lighting such as streetlamps. Automatic high beam, as explained is opposite beam detector. An-other probable application of automatic high beam is our high beam response due to another high beam and automatically our high beam becoming glow. Now a day there are many accidents that cause from the beam light. Our work proposes an effective automatic control of the vehicle Head lamps based on the detection of headlights and taillights under nighttime Road conditions. This project is about to control high/low beam automatically. This Project will make sure that the consumer will save their time and energy also for those who have the illness of nervous. This project will not disturbing any manual function of the beam.

The objective of this project is to develop a safety feature in cars to avoid colliding with a vehicle or an obstacle in the way. The main objective of this system is to help driver prevent car collisions due to blind spots and their carelessness while driving. Collision avoidance systems are especially useful in bad weather conditions. The sensors in the car would be capable of detecting even in the poor conditions and would inform the driver distance from the various objects in front

Of the car which will help the driver to drive safely in such poor conditions and a central microcontroller would also be able take decisions according to different situations. For example, fog affects visibility, the sensors would recognize another car and alert the driver of any dangers that lie ahead, giving the driver enough time to slow down, allowing him to escape from what could have been a bad accident.

Brakes are the most important components of a car as they are the primary source to bring the car to a halt. Failure to brake can result in a disaster and Advanced Headlight Monitored and Collision Prevention System in Automobiles.

Manufacturers are increasingly working to make breaking on their vehicles efficient for better passenger safety. Different vehicles use different types of brakes; while some use drum brake, some use a disc brake and then of course there are added technologies such as ABS and ESP which further aid better braking.



II. LITERATURE SURVEY

A. Murugan Ezhumalai, Venkat Subramanian, Venkatraman, Drowsy Driver Detection and Accident Prevention System using Bio-Medical Electronics.

The traditional vehicle-based and vision based drowsy detection become apparent only after the driver starts to sleep, which is often tool ate so prevent an accident. In this proposed project a buzzer with low power consumption, is placed near the driver which would wake up the driver while he falls a sleep while driving. The EEG sensor senses the brain signals and also the eye blink of the driver using ADS 1299, and the entire device is operated using an Op-amps TLV2760. The EEG signal is converted to digital using ADS 1299 Analog frontend and the output is acquired using MSP 430G2553. The speed of the car will be varied according to the EEG signals. If the car slows down the indication is displayed at the back of the car using a LED display. Thus a sensor able to detect the activities and components of brain is important for comprehensive care and analysis of body conditions. The Low cost embedded drowsy driver detection system determines the sensor result and if it is below or above the optimum value it will indicate by the buzzer and the LED indication at the back of the car will help others viewing the vehicle slowing down.

T.Hacibekir presented a paper of the hardware in loop simulation of an Adaptive Head Light System for Motor Vehicle. In the paper the real time vehicle and the road models are used for that and the hardware in the loop simulation setup proposed for testing adaptive head light concept are presented. Real time simulations using simulator are used to illustrate the approach .The aim of development in active safety is to reduce there action time of driver by improving visibility and thus achieve a significant increase in road safety and driving comfort. Study On Adaptive Front Lighting System Of Automobile Based On Microcontroller. This system represents, when the automobile turns in curve at night, it can always appear the blind spot in the turn, for the lights are unable to adjust the illumination angle. In order to enhance safety driving at night, an adaptive front-lighting system (AFS) of automobile controlled by core of electric control unit. The AFS is based on the steering wheel angle and speed changes to adjust light axis angle to light up the road in the front, so the driver's security vision are improved.

III. PROBLEM STATEMENT

Today in this fast moving world, new technologies have been evolved for every second for our human life style improvement. There have enormous advancement in automobile technologies already and still to come. Because of

These technologies, now we are enjoying the necessary comfort and safety. But There are lots of accidents happening now-a-days .It is because of increased vehicle density, violation of rules and carelessness. India ranks fifth in the road accidents over the world, and prevent accidents during night times due to high beams of light

IV. OBJECTIVE

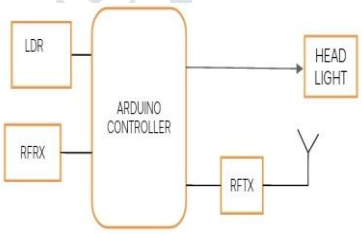
- To minimize the road accidents due to above mentioned facts in real time using embedded systems platform in low cost. In our project, we proposed few concepts to minimize the accidents due to Collision of vehicles and with headlight glare and temporary blindness.
- To allow safer driving.
- To avoid blinding other vehicles or pedestrians.
- To carry out before and after studies and to demonstrate improvement in problem solutions.

V. METHODOLOGY

Sensor based approach:

This method uses a light intensity sensor in order to detect presence of incoming traffic in night scene. Sensor is usually a photo sensitive device, LDR is used in, for detecting light intensity. There is a linear relation among sensor output and light intensity. Outputs of sensor are converted in to digital form so as to compare the against threshold. Threshold is useful to identify presence of vehicle and it is fixed at a point where abrupt intensity change occurs. In head light glare from oncoming vehicle is notified to that vehicle. Such communication is used to reduce incoming light intensity.

VI. BLOCK DIAGRAM



VII. HARDWARE AND SOFTWARE COMPONENTS

LDR Sensor
555 Timer
LM 7805 regulator
IR Sensors
Arduino Uno
Relay
16*2 LCD Display

SOFTWARE COMPONENTS:

Arduino Ide
Embedded C

VIII. APPLICATIONS

1. Can be used as warning system to avoid collision.
2. Used to detect an extreme conditions like fog and misty areas.
3. Can be used in large vehicles like buses and trucks.
4. Can be implemented in robotic applications.
5. Can be implemented in maritime electronics.

EXPERIMENTAL RESULTS

A system of safety development in cars that avoids collision and prevents accidents and even prevents accident caused due to blind spots during night times.
An experiment is conducted in laboratory and a protype was designed as shown below

Figure:Experimental setup

CONCLUSION

Road accident is being increased deadly day by day.
Especially in our country most of the drivers don't follow the driving rules and regulations. Even they don't know that high headlights beam might be the cause of dangerous Road Accident. Thousands of people lost their lives in every year by road Accident. Matter is that our government is also not con-cerned about this problem.
So if we can implement this device in all vehicles of our country, the device will switch the high beam of those vehicles to low beam whenever it will get another vehicle coming towards with high beam. In fact if there is no light the device will work through IR technology.
As a result the road accident will be decreased rapidly. It is possible to implement because the device is cheap in cost, easy to implement and it works automatically. We hope our de-signed device "Automatic High Beam Controller" will reduce the rate of road accidents mostly high way road accidents.

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