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Smart Headlight Auto-Switching System

Siddhi Wanzkhade [E&TC JSPM]
Gauri Chandgude [E&TC JSPM]
Tejaswi Sawant [E&TC JSPM]

Abstract - The advancement of auto-motive technology has reached its peak. Also the development of a driverless car i.e an autonomous vehicle is one of its most revolutionary elements. Without the assistance of a human, an autonomous vehicle automatically regulates motion, sensor activation, and action. These automobiles provide a high level of comfort, safety, and ease of operation. Our project's goal is to create a system for usage in such autonomous vehicles, to create an automatic headlight dipper and automatic switcher. This technology not only automatically switchs the headlight on or off but also it will sense the opposing vehicle's beam status and change the headlight's beam intensity and also reduces the Troxler Effect (Temporary Blindness). Our system is created using a Light Dependent Resistor (LDR). The installation of such a gadget in vehicles can relieve traffic and reduce accidents that occur at night as a result of driver distraction. We have used light dependent resistor as well as a real-time clock. When both cars pass by one another ,the beam alternates between a high and low condition depending on the threshold value.

Key Words : Auto-Switching headlight, Troxler effect, upper and dipper, LDR.

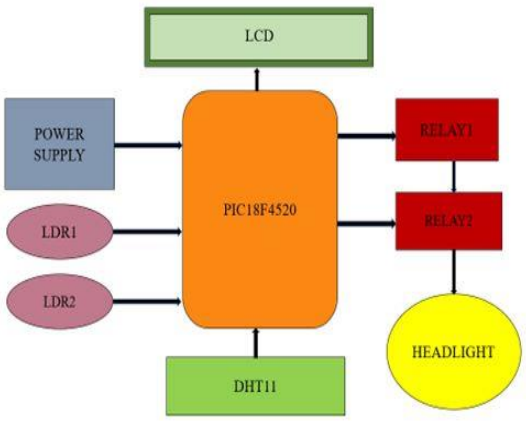
1.INTRODUCTION

Headlight is very common and much required equipment while night driving. The headlight assists the driver for better vision and helps to reduce troxler effect during travelling at night . This system will help to auto switch the Headlight beam from bright to low dim light using the upper dipper function. This system will also display the humidity and temperature of the surrounding atmosphere . The main motive of this system is to reduce accidents.

2. Description

Initially, The Light dependent resistor (LDR) 2 checks the light intensity of the surrounding, and gives it to PIC18F4520. It is very easy to tell if its day or night time depending on this surrounding light intensity. The headlight is then turned on or off depending on the intensity. Similarly, the intensity values from the opposing vehicle are read by the Light Dependent Resistor (LDR) 1. These readings are sent to the PIC18F4520. If the value of the light beam exceeds/goes above a certain value, which indicates that the vehicle is coming near us, our system switches the beam of the headlight from high to low using a 5volt relay. There is also a DHT11 sensor that takes the temperature and humidity values from surrounding and displays it on the LCD. The similar process takes place in the opposite passing vehicle also. Once the vehicles have passed by each other ,the intensity of light again goes from low to high. Thus, the system automates the headlights and assists the driver , preventing from accidents and troxler effect.

Block Diagram



Special Features:

- Easy to operate
- Automatic upper and dipper
- Automatic switching on ignition
- Hassle-free operation
- Less power required
- Decrease in accidents

RELEVANCE TO THE PRESENT INDUSTRIAL SCENARIO :

•This system is effective in reducing the number of accidents occurring at night time. It protects the driver's eyes from high headlights beam that will be able to damage the internal parts of the human eyes.

•There are many other practical and effective components that are used to implement this vehicle headlights control system other than Arduino UNO. PIC18F4520 Micro-controller is used in our project which acts as the brain of the project to adjust vehicle headlights based on the vehicle approaching from an opposite direction, LDR to adjust the vehicle's headlights according to the surrounding lighting condition and DHT11 to check temperature and humidity.

•The idea of our project was realized by interfacing the functional components and uploading programming code to the micro-controller to achieve the working efficiency and to get the expected ideal outcomes.

•Consequently, we can implement this system in recent vehicles models.

•There are many advantages which are achieved by this system such as decrease the occurrence of daily accidents and reduce energy consumption. Also, reduce the effects of high headlights beam into driver's eyes. In fact, this system will automatically control vehicle headlights without manually adjusting headlight.

3. CONCLUSION

The flexibility and control of the headlight will allow us to perform numerous tasks like allowing drivers to use high beams without glaring any other driver on the road, allowing oncoming drivers to see the vehicle and road clearly despite the high beams, allowing drivers to see better in rain, snow, and fog, and allowing better illumination so lanes, sidewalks and dividers can be visible clearly. This system/project not only just adjust the intensity of the light but also switch the headlights of the vehicle on and off depending upon the time of the day with the help of LDR and makes the system/project hassle free and relevant and beneficial for the drivers. Smart headlight auto switching system can: Auto-level, adapt to curves, detect light levels and turn on or off automatically. The implementation of our project in automobile field will bring safety and avoid huge accidents.

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