

Tilting Headlight

Keerthana. P.M¹, Keerti Balaji. M², Maanya.K³, Pavithran. L.M⁴

Department Of Computer Science And Engineering, SNS College of Technology, (An Autonomous Institution),
Coimbatore-35

Mrs. P. Subhashree, ASP, Department of CSE, SNS College of Technology, Coimbatore, India

ABSTRACT

Major accident occur during night time. Roads have poor lighting facilities which makes the surrounding dark. This project is an idea of “TILTING HEADLIGHT” to solve the mentioned problem occurring frequently in today’s world. The headlight will tilt automatically during the night time according to the road. The vision will be more clear to the driver at nights. This headlight can be turned to left and right at required direction during the night time. This will help the driver’s to have a clear view of roads and vehicles coming from different sides. This project is completely a hardware project. It is developed using 9V and 5V batteries, voltage regulator, servo motor, servo tester and LED. The steering is attached with the servo tester which helps in turning the headlight according to the driver’s needs.

INTRODUCTION

A headlight is a light attached to the frontside of a vehicle to illuminate the road ahead. Headlights are also often called headlamps, but in the most precise usage, headlamp is the term for the device itself and headlight is the term for the beam of light produced and distributed by the device. Earlier, headlamps powered by oil or acetylene gas. This project requires 12V DC Battery to give supply for servo motor, servo tester, LED, SG90 DC servo motor two, CCPM three mode Servo tester to control the servo motor., Step down voltage regulator to decrease the voltage., Connecting wires to connect the all components according to the circuit diagram., one way switch to control over all supply, Light-emitting diode(LED) to act as the head light of this project, 10Ω resistor to save the LED.

LITERATURE REVIEW

The paper here is all about moveable headlights with latest technology. The most conventional steering arrangement is to turn the front wheels using a hand-operated steering wheel which is positioned in front of the driver, via the steering column, which may contain universal joints to allow it to deviate somewhat from a straight line. Rack and pinion steering gear mechanism where the steering wheel turns the pinion. The pinion moves the rack, which is a linear gear that meshes with the pinion, converting circular motion into linear motion along the transverse axis of the Vehicles.

SYSTEM SPECIFICATION

Hardware Specifications

Servo motor

A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback.

Servo tester

Servo control is a method of controlling many types of RC/hobbyist servos by sending the servo a PWM signal, a series of repeating pulses of variable width where either the width of the pulse or the duty cycle of a pulse train determines the position to be achieved by the servo. The device also can be used as a signal generator for electric speed controller (ESC).

LED

A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. The color of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the band gap of the semiconductor.

Battery

A battery is a device that converts chemical energy contained within its active materials directly into electric energy by means of an electrochemical redox reaction.

Voltage regulator

A voltage regulator is a component of the power supply unit that ensures a steady constant voltage supply through all operational conditions. It regulates voltage during power fluctuations and variations in loads. It can regulate AC as well as DC voltages.

Connecting wires

A wire is a cylindrical, flexible strand or rod of metal. Wires are used to bear mechanical loads or electricity and telecommunications signals.

Software Specifications

EasyEDA

EasyEDA is an easier and powerful online PCB design tool that allows electronics engineers, educators, students, makers, and enthusiasts to design and share their projects. This is a design tool integrate LCSC components catalogue and PCB service that helps users to save time to make their ideas into real products.

KiCad EDA

KiCad's Schematic Editor supports everything from the most basic schematic to a complex hierarchical design with hundreds of sheets. Create your own custom symbols or use some of the thousands found in the official KiCad library.

EXISTING SYSTEM

Various types of headlights are available in today's market. There are halogen lamps, led lights and more varieties. All these lights are fixed in a straight direction facing front of the vehicle. The direction of these lights cannot be changed or adjusted. These lights are fixed. These lights only provide straight view during nights. For additional view during nights we need extra lights which will also be fitted in constant direction. So the driver's cant adjust any of the available options of headlights.

PROPOSED SYSTEM

This project, is about developing a tilting headlight. It is developed using 9V and 5V batteries, voltage regulator, servo motor, servo tester and LED. The steering is attached with the servo tester which helps in turning the headlight according to the driver's needs. This light does not have any particular direction by default. This light can be adjusted according to the view required by the driver while driving in night.

CONCLUSION

The Tilting Headlights works according to the need of driver when it is turned. The prototype worked accordingly as required and served as a perfect diecast for the real time project idea. So this project model will be successful and fully functional in the selected industry. The Headlight tilting according is the concept necessary for the fast moving world. This concept prevents the accidents at the highway at night. This system can be easily fitted in the small space in car. It is less costly. It is of less maintenance.

FUTURE WORK

In future sensor technology can be used to tilt headlights using real time vehicle source. There are abundant parameters to optimize the illuminance distributed on the measuring screen. Using this method, the optical lens of both low-beam and high-beam light can be designed. Through numerical simulation, headlamp with these lenses can fully comply with the ECE regulation without any other lens or reflector. Also we will try to connect the steering directly to the steering instead of using sensor technology in order to reduce the cost as a economic range of our project.

REFERENCES

- [1]. Pankaj Kumar Singh, "Development of an Adaptive Steering Controlled Headlight for Low Cost Vehicles" 5578-PJ12023 (Jan 2018)
- [2]. Teddy Brooks, "Automotive adaptive front lighting system": SPRUHP3 (July 2013)
- [3]. Jayleebenson, Title: Steering Controlled Headlight Mechanism ISSN: 2278-0181 (Dec 2021)
- [4]. Ollie Norris, "Vehicle Classification in Night time using Headlights" PD097UHP6 (June 2017)



- [5]. Kalyani Gaikwad, Ramesh Mali A Survey on “Automobile Headlights Adaptive Control System”ISSN: 2347-6710 (5, May 2017)
- [6]. Talha Shaikh, “Headlight Automation article” 1836-1123 (Aug 2021)
- [7]. Sunil Agarwal, “Automation in Headlight industry” SDFR-1123-1187 (Feb 2019)
- [8]. Hattie Shortle, “A Case study: headlight Tilting According to steering” ISSN: 2454-9150 (Sep 2018)
- [9]. Shunmugham R. Pandian, —A Human Power Conversion System Based on Children’s Playl, 0-78038390-7/04/\$20.00 (C) IEEE.
- [10]. Green, Robert E. et al. (eds) (1996), Machinery's Handbook (25 ed.), New York, NY, USA: Industrial Press, ISBN 978-0-8311-2575-2.