

Adaptive Headlight System

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Abstract: According to traffic accident data, the maximum of severe road accidents occurs at night vision. Therefore it is of great importance to use available technology to contribute to road safety by increasing the visual conditions provided by vehicle headlights. The topic of this project is adaptive headlights that are headlights and side indicators. Their feature is that they turn with the steering, so that the driver of the vehicle can see the bend, what driver is actually turning into. These type of headlights appeared on production cars in the 1920's along with turn of the steering the adaptation will be in the form of Light intensity for headlights and moisture sensing for side indicator lights.

Keywords: Traffic accident, Road Accidents, Vehicle Headlights, Side Indicators.

1. INTRODUCTION AND PROBLEM DEFINITION

The rate of accident are much and more at the night drive then at the day light, for avoiding the accidents these concepts are very useful for automobile.

The reason has to why focus on the subject of producing the safety of car is related to the statics and to the expose the serious consequences of accident in 2014 out of 6,98,451 people from accident 4,882 people dead and remaining people has injured with a corresponding financial loss in India.

Adaptive headlight system moves the headlights by turning the vehicle through the steering. This places light into the turning radius visibility at the cornering improved.

The present invention relates to headlights of an automobile, more particularly to a direction turning device for headlamps of the vehicle which enables to turn direction synchronously with the rotation of the steering and hence increasing the safety for driving at night or in the darkness.

In the known technology of the prior art, a headlight of the vehicle has a fixed line of emission which is aligned with the front direction of the vehicle. Although the effects of "high beam" or "low beam" can be achieved by adjusting the angle of elevation of the headlamp, the direction of emission is not adjustable as to the left or right.

When the road curves or turns, the corner on time when the vehicle turns, thereby creating a dead angle of illumination and such lack of visibility poses danger in driving at night or in darkness.

Therefore, it is highly desirable to invent a device to solve this problem and such device is of high utility. An object of the present invention is to provide a direction turning device for a headlight of the vehicle which renders to emission direction of a headlight of an automobile in synchronization with steering and thus increases the illuminated area upon changes of direction of the automobile when the automobile makes turns.

2. REQUIREMENT ANALYSIS

Components	Cost
Atmega 328P	210
16 MHz crystal	10
22 pf capacitor(2)	1
220 ohm resistor(2)	1
10 k ohm resistor	10
reset switch	5
28 PIN IC Stand	15
female power jack	10
9V- 1amp power adaptor	110
7805 voltage regulator	20
heat sink for 7805	25
10micro farad capacitor(2)	1
Capacitor, tantalum, 10µF, 25V(2)	10
IR sensors	100
LCD 16X2	165
potentiometer 5k	10
green and red led	
Moisture sensor	375
LDR	10
Servo motor	300

Table 2.1 Requirement Analysis

3. DESIGN

3.1 Flow Chart:-

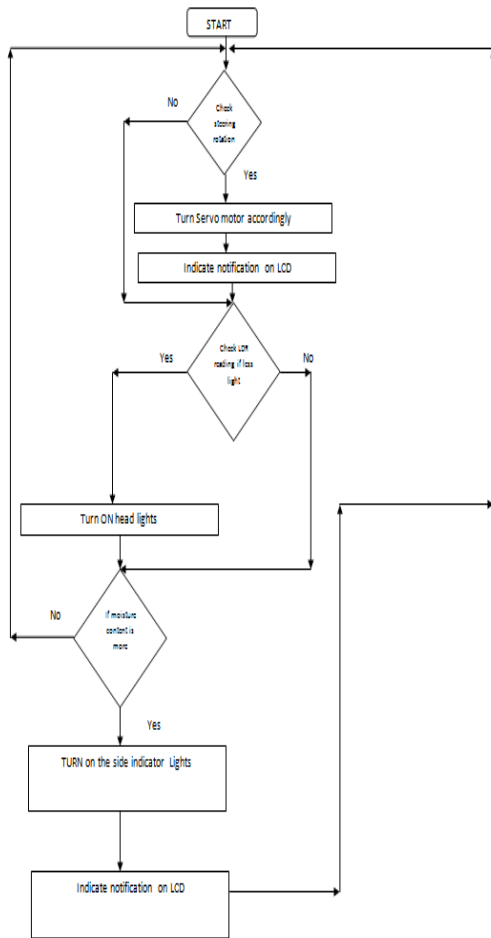


Fig 3.1 Flow Chart

3.2 Block Diagram:-

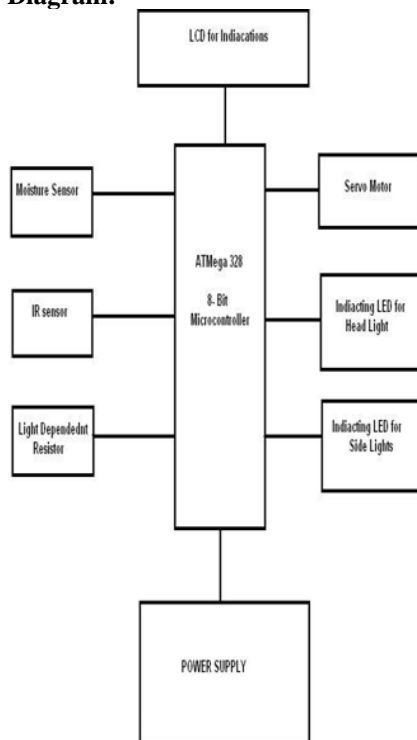


Fig 3.2 Block Diagram

4. WORKING OF PROJECT

Following are the some of the essential components used:

1) LDR:

In the absence of light it is designed to have a high resistance in the range of mega ohms. As soon as light falls on the sensor, the electrons are liberated and the conductivity of the material increases and resistance decrease.

2) IR sensor:

IR Sensors work by using a specific light sensor to detect a select light wavelength in the Infra-Red (IR) spectrum. By using an LED which produces light at the same wavelength as what the sensor is looking for, you can look at the intensity of the received light. When an object is close to the sensor, the light from the LED bounces off the object and into the light sensor. This results in a large jump in the intensity, which can be detected using a threshold.

3) Servo Motor:

Servos are controlled by sending an electrical pulse of variable width, or **pulse width modulation (PWM)**, through the control wire. There is a minimum pulse, a maximum pulse and a repetition rate. A servo motor can usually only turn 90° in either direction for a total of 180° movement. The motor's neutral position is defined as the position where the servo has the same amount of potential rotation in the both the clockwise or counter-clockwise direction. ATmega 328 is 8 bit microcontroller used as the CPU of the system.

On this system we are going to implement total three features as below

- Turning head lights with steering
- Turn ON/OFF headlight
- Turn Side light ON/OFF

We decided to give first priority to the turning of head lights as that is the event that can occur at any time. Then second priority goes to turning head lights ON/OFF. And last priority goes to changing the state of the side indicators. Event of turning the headlight will be triggered with help of the IR sensor. As we aware with the IR sensor principle we will place two IR sensors on either side of the steering at the predefined angle. IR transmitter will be connected with steering and receiver will be places on either side as steering turns transmitter will also get turned and transmitted signal will be received by the receiver and it will generate pulse that pulse will be considered as the trigger for indication of turning of steering and accordingly we will start the rotation of the servo motor.

Turning OFF/ON state of the headlight will be decided on the day light intensity. LDR will be used to sense light intensity when light intensity is less headlights will gets turned on. Side indicators are used mostly in foggy conditions and that condition can be determined with help of moisture sensor. And moisture level will be used to turn side light ON/OFF. In order to execute this we are going to code the micro controller with the embedded C and Arduino IDE will be used to compile the code.

5. APPLICATION

This project will be applicable in various situations. These are as follow.

- This project can be used in vehicle while vehicle about to turn. As vehicle's light automatically turned when vehicle tried to turn.
- In rainy season the indicator present in the vehicle can be automatically glows. So vehicle can be easily seen.
- This will also on or off the headlights of vehicle.
- This project can also implemented in home or remote places to on or off the lights as per the surrounding light.

6. CONCLUSION

From the intelligent headlight project we can avoid the probable accidents that might happen in our country or in world. We will turn light when vehicle about to turn this is helpful in many situations. As the material we are using to develop this project is very low cost so this is also cost effective project. This can be easily implemented in all vehicles in the India.

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