Automated headlight intensity control and obstacle alerting system

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Abstract - *Headlight intensity of vehicles poses a great danger during night travel. The drivers of most vehicles use high bright beam while driving at night. This causes inconvenience for the person travelling from the opposite direction. Person experiences a sudden blaze for a short duration. When these headlights shine brightly, they cause a temporary blindness to a person, resulting in road accident during night . To avoid such incidents, we are designing a prototype of automatic headlight intensity control system. The obstacle alerting system helps the driver parking the vehicle during day and night time without colliding the vehicle with obstacles.*

Key Words: ARMCONTROLLER, ZIGBEE, IRSENSOR, PHOTOTRANSISTOR, ADC.

1. INTRODUCTION

In the modern world, everyone wants to reach their destination as soon as possible so number of vehicles daily increase. During the day time vehicles will be more so people wish to travel at night in order to save the time. High beam of vehicles poses a great danger during night driving. The drivers of most vehicles use high bright beam while travelling at night. This causes uncomfortable to the person travelling in the opposite direction. He experiences a sudden blaze for a short period of time. This is caused due to the high intensity of headlight beam from the other vehicle coming towards him in the opposite direction. We expect that person to dim the headlight beam to avoid the blaze. This blaze causes a temporary blindness to a person, resulting in accidents during the night, so we must reduce the intensity of headlight beam in order to avoid accident during the night. Many people do not follow the rules of making the headlight beam dim, so it must be automated. About 33 percentages of accidents occur during the night instead of day and also tend to have higher percentage of death, even the number of vehicles is very less compared to day. As per survey done by researchers the Possible risk related to road accidents is double compare to day time [1].

During parking the vehicles during night or day time driver will not be known what is present in front or back of the vehicle even after seeing the mirror. So in order to avoid the collision with the obstacle with the vehicle, the obstacle sensor is placed in front and back of the vehicle so that the driver gets a warning. He could control colloid with the obstacle.

1.1 Problem statement

During night people travel because to avoid traffic during day time and save time. While travelling in night oncoming vehicle uses high beam so the person driving the vehicle feels blaze for short duration of time it might lead to accidents. According to motor act when the vehicle is coming in opposite direction he has to lower the beam but no one follow the rules. At present technology used in vehicles is manually lowering the beam, but no one dims the beam light. So it has to be made automated so it automatically dims the headlight intensity and thus it prevents accidents during night.

1.2 Proposed solution

The proposed system it is expected that the problem of temporary blindness against would be the luminous intensity of the headlight of the vehicle come to the fore, that the analog-to-digital converter (ADC) can be sent to sense signals to digital signals [5]. The analog-to-digital converter converts there digital signal to the ARM controller when the threshold intensity is set. It would compare and sends this signal to the other vehicles via XBee system as soon as the other system receives the signal via the XBee the pulse width modulator in the system is connected would reduce the intensity of the headlight to the received intensity. The same function is performed absorbed by the system in the other vehicle.

2. METHODLOGY

For developing system which provides the solution for the temporary blindness and obstacle alerting system during parking the vehicle, phototransistor is used to sense the headlight intensity of the coming vehicle.IR sensor is used to sense the obstacle which is present during parking of the vehicle. ADC is used to convert analog signal to digital signal. For the implementation of the system should have the knowledge about the arm controller, photo transistor, infrared sensor, Zigbee, ADC, dimmer circuit and also knowledge of programming and interfacing it with arm kit.
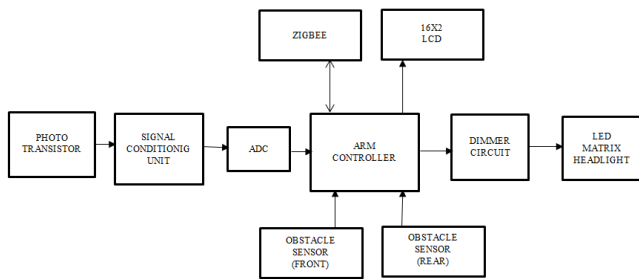
3. Implementation idea

Fig.1 Block diagram of proposed solution

Photo transistors interface with the arm controller via signal conditioning unit and add. Photo transistor receives the light from the headlight of oncoming vehicles it will be in analog form, and then it will be converted to a digital signal. In arm controller it checks the intensity level of the head light. If the head light intensity is high, it passes the information to the oncoming vehicles to lower the head light intensity through Zigbee this damaging. Process will occur similar to both the vehicles. Dimmer circuit is used to reduce the intensity of the light.

IR sensor is also interfaced with the arm controller it detects the obstacle while parking the vehicles. The IR sensor will be placed in the front and back bumper of the vehicles during parking if any obstacle presents it warns the driver so that he can safely park his vehicles without causing damge to his vehicle.
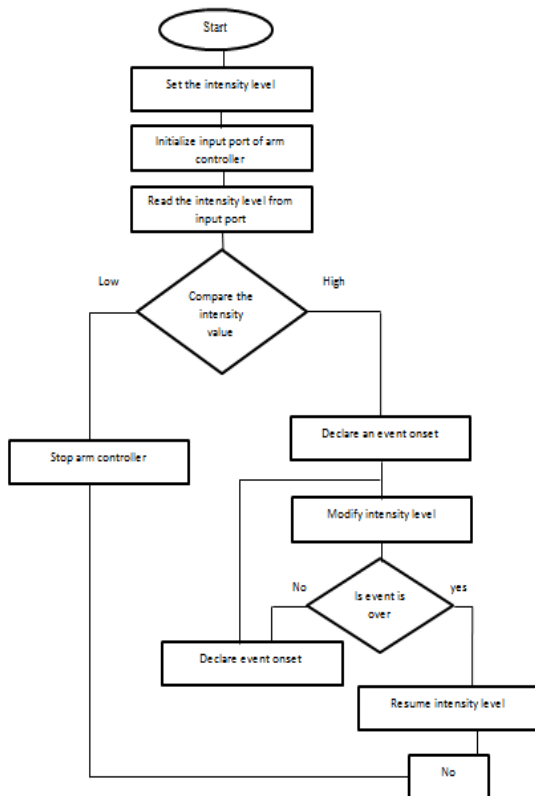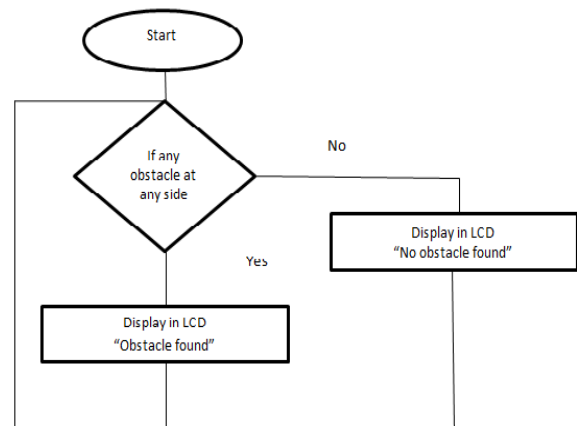
Fig.3 Flow diagram for obstacle detection

Above Fig.2 and Fig.3 shows the flow diagram of head light control and obstacle detection. In fig. 2 it shows how the head light intensity is control of oncoming vehicles by the help of Zigbee. In fig. 3 it shows how obstacle is detected using IR sensor and helps the driver to park the vehicle. If any obstacles are present it warns the driver so colliding with obstacles can be avoided.

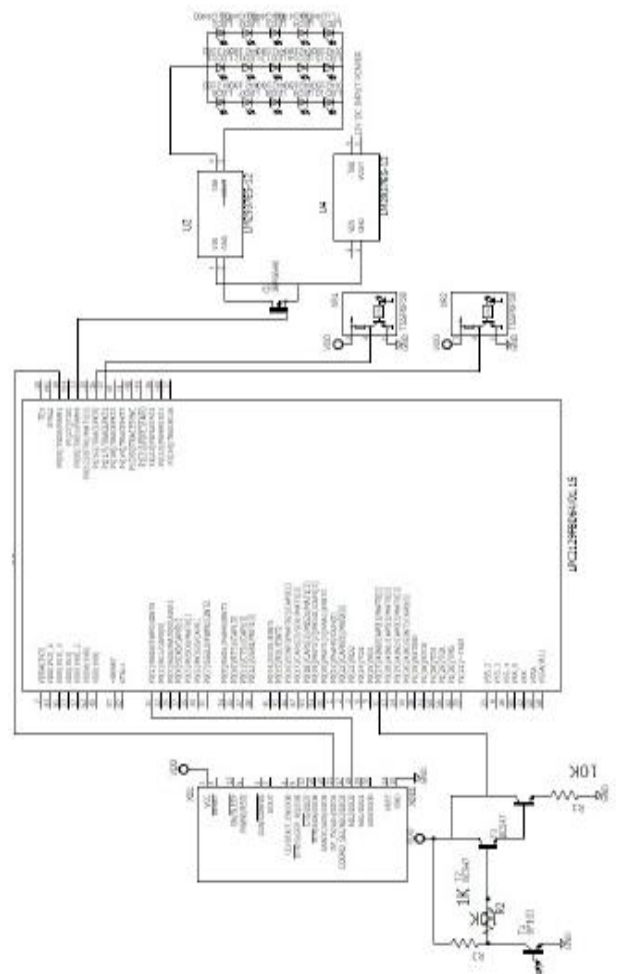Fig.2 Flow diagram of headlight intensity control

Fig.4 Circuit diagram of whole system implemented to controller

Fig.4 shows the entire circuit diagram whole system implemented to controller. Photo transistor is connected with Darlington circuit to the port 0.27 of the controller which receives the light signal from oncoming vehicle. The IR Sensor connected to the port 1.16 and 1.17 which helps in detection of the obstacles during parking of vehicle. XBee is connected to port 0.0 and 0.1 of the controller which is used for transfer and receives the signal. Dimmer circuit is connected to port 0.8 which as dip and dim operation in headlight.

4. Conclusion

In this project automatic headlight intensity beam is controlled by using photo transistor, XBee and ARM controller. The work gives the solution for night temporary blindness which is caused by high beam headlight intensity could be cured .so the accidents can be reduced during night time so people can safely travel in night time.
To reduce colliding with the obstacle during parking by using LCD IR Sensor and ARM Controller. During parking of vehicle its help the driver safely parking his vehicle and without damaging the vehicle. It is very cost effective and high performance system.

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