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Smart Vehicle Headlight Dimmer

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Abstract: *Smart Headlight Dimmer is a component in which we can decrease the number of accidents that are causing due to high intensity of light during night times. This helps to reduce the causing of accidents due to Troxler effect. This device helps us to adjust the intensity of the beam of the headlight according to the intensities of the surrounding light. When the intensity of the surrounding light is high, then the headlight automatically dims. It also helps in other cases like if the Ultrasonic sensor does not work, then if any accidents occur it will send a message to the authorised contacts along with the location using the GPS and GSM Modules.*

GSM module send the alert message on your mobile with the location of the accident. The advancing technology has made our day today lives easier. Since every coin has two sides similarly technology has its benefits also as its disadvantages. the rise in technology has increased the speed of road accidents which causes huge loss of life. The poor emergency facilities available in our country just increase this problem. Our project goes to provide a solution to this problem also.

Keywords: *Arduino Uno, Light Dependent Resistor (LDR), Ultrasonic Sensor, GSM, GPS.*

I. INTRODUCTION

Now a day's many road accidents take place because of high intensity of light. Beam light of vehicles pose a great damage during night driving. The drivers of most vehicles use high, bright beam while driving at night times. This causes a discomfort to the person travelling from the opposite direction. Person experiences a sudden glare for a short period of time, driver or person who is travelling from opposite direction may become blind. This is caused due to high intense headlight beam from the other vehicle coming towards the person from the opposite direction.

To overcome the above problem, head light automation is the best solution. Light Dependent Resistor (LDR) and ultrasonic sensor play a role to dim the headlight of vehicle to avoid eye effects and accidents based on distance and light intensities of opposite vehicle. The vehicle having headlight automation gets dim to avoid the accidents. This automatically switches the high beam of light into low beam of light. There are some situations where the device may sometimes fail. At those situations, we have another alternative. We have introduced a GPS module and GSM module to authorize the contact number. When an accident occurs, it will send a message to all the authorized contact numbers along with the latitudes and longitudes of the location of the victim.

The system has an on-board module that it resides in the vehicle to be tracked and a based station that monitors data from the various vehicles. The on-board module consists of GPS receiver, a GSM modem. This hardware is fitted on to the vehicle in such a manner that it was not visible to anyone. That system sends the location data to the monitoring unit continuously therefore it is used as a covert unit. The location data from tracking system uses to find the location and to give the information to police when the vehicle is stolen. This gives an edge over other pieces of technology for the same purpose. The system automatically sends a return reply to that particular mobile indicating the position of the vehicle in terms of latitude and longitude when a request by user is sent to the number at the modem. A program has been developed that it is used to locate the exact position of the vehicle and also to navigated track of the moving vehicle on Google map. The system allows to track the target anytime and anywhere in any weather conditions. This system is user friendly, easily installable, easily ecosystem is user friendly, easily installable, easily accessible and can be used for various other purpose.

II. LITERATURE SURVEY

These technologies or methods have certain limitations due to which they have been restricted to the theoretical domain. We studied these methods and segregated them and analysed their drawbacks. Our critical review has been briefed on the following.

The National Safety Council says Traffic Death rates are three times greater at night than during the day. More than 40 percent of all automobile accidents resulting in death occur at night, despite the fact that there is up to percent less traffic on road during than during the day. Road accidents are more in night than during day due to low visual conditions. We have also studied many reviews that happened due to communication failure and immediate medical help

III. SYSTEM ARCHITECTURE

Framework's configuration is that the way toward characterizing the planning, modules, interfaces, and knowledge for a framework to fulfil determined prerequisites. Framework's configuration might be viewed because the utilization of frameworks hypothesis to item advancement. It likewise focuses on the importance of framework structuring stage during the time spent framework advancement. Framework structuring regarding programming building has its own worth and significance within the framework advancement process beat all.

A. Architecture

The proposed framework design utilizes LDR sensor as a sensor to detect the intensity of the sunshine and makes the switching of the headlight beam. Tampering sensor is sensor want to detect if any accident occurs. The Ultrasonic sensor is employed to sense the intensity of the sunshine of the headlight of the other vehicle. Arduino Uno with Atmega328 is employed as an interface between the sensors and therefore the software used -Arduino IDE. GPS module and GSM module are wont to track the live location of the person and sending of SMS to the authorized contacts respectively. The diagram consists of LDR sensor, Ultrasonic sensor, Arduino Uno, Tampering sensor, headlight and negative feedback circuit. The Arduino Uno has an IC called Atmega328 which has 16 pins. The ultrasonic sensor consists of 4 pins called VCC of 5v, GND, ECHO, Trigger. These VCC and GND pins are connected to the facility supply. The Echo and Trigger pins are connected to the two ,3 pins of the IC respectively. Coming to the LDR it's connected to the pin 4 of the IC. Tampering sensor is connected as same as that of the Ultrasonic sensor, but the sole difference is that it doesn't have any Echo and Trigger pins like ultrasonic sensor. it's connected to the pin 6 to the IC. The GPS module and GSM module is connected to the Rx and Tx pins respectively. These are connected to the facility supply using 5v, GND pins. Headlight is connected to the negative feedback circuit which is connected to the pin 6 of the IC.

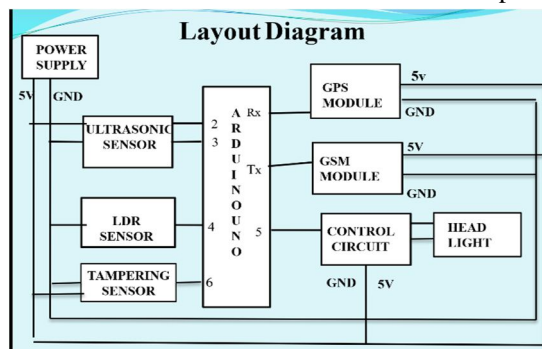


Fig. 1 Plan of the Connections

B. Principals

- 1) **LDR Working Principle:** The working rule of an LDR is photoconductivity, which is nothing but a physical phenomenon. When the sunshine is absorbed by the fabric then the conductivity of the fabric enhances. When the sunshine falls on the LDR, then the electrons within the valence band of the fabric are wanting to the conduction band. But, the photons within the incident light must have energy superior to the bandgap of the fabric to form the electrons jump from one band to a different band (valance to conduction). Hence, when light having ample energy, more electrons are excited to the conduction band which grades during a sizable amount of charge carriers. When the effect of this process and therefore the flow of the present starts flowing more, the resistance of the device decreases.

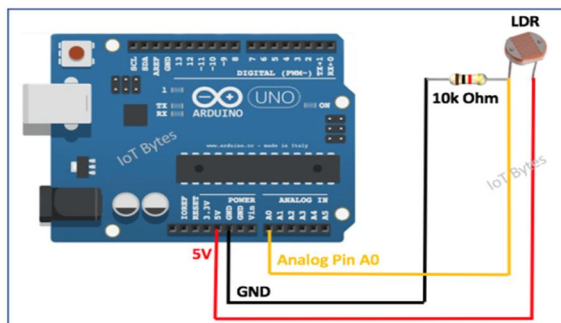


Fig. 2 LDR associated with Arduino Uno

- 2) *GSM Module Working Principle:* GSM Module is connected to the Tx pin of the Arduino Uno. It is used to send messages to the contacts if any accident occurs. We can connect to the GSM module to the Arduino Uno using the Tx pin. The GPS module may help to trace the present location of the victim and send the messages to those contacts alongside the latitude and longitude of the situation. SIM800L GSM/GPRS module may be a miniature GSM modem, which may be integrated into an excellent number of IoT projects. you'll use this module to accomplish almost anything a traditional telephone can; SMS text messages, Make or receive phone calls, connecting to internet through GPRS, TCP/IP, and more! To top it off, the module supports quad-band GSM/GPRS network, meaning it works just about anywhere within the world.

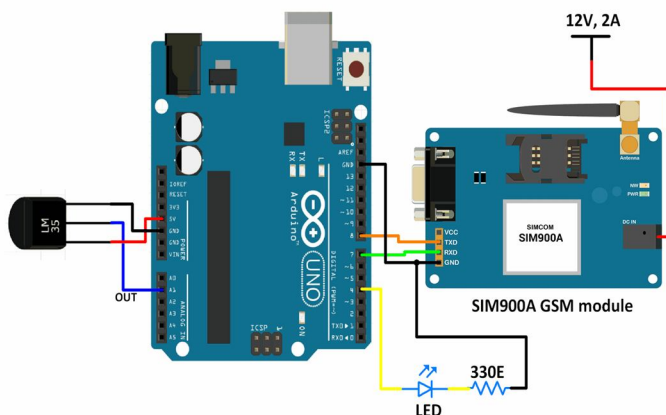


Fig. 3. GSM Module associated to the Arduino Uno

- 3) *GPS Module Working Principle:* GPS module is employed for pinpointing the situation of the device and also to synchronize the device time. If the device time drifts for quite 3 seconds from the GPS time, the device is resynchronized thereto. this enables to make certain that the device records in server represents events that were happening at that exact time. GPS modules constantly outputs information packets to microcontroller containing information like speed, altitude, longitude, latitude and therefore the quality of the GPS signal.

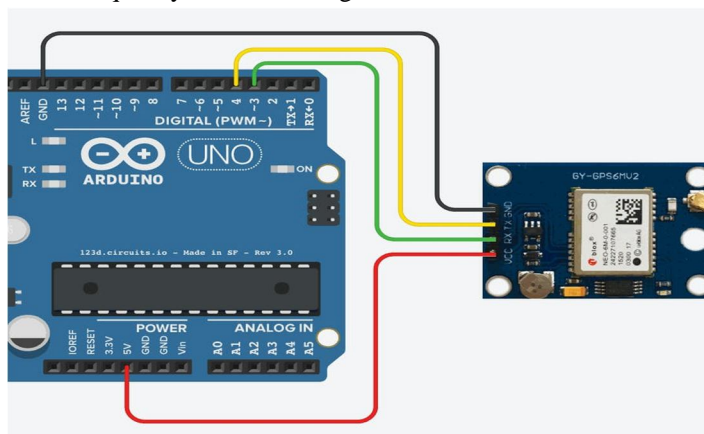


Fig. 4 GPS associated to the Arduino Uno

IV. FUTURE WORK

The use to headlights on automobiles has involved a compromise between providing enough light for drivers to see the road ahead and avoiding the excessive light that produces glare. this technique eliminates human error from the scenario, which successively allows the driving force to focus on safely navigating the road rather than manually adjusting headlight settings. Technology has brought changes to headlight, interior surfaces, and therefore the highway environment that directly reduce glare or indirectly reduce the effect of glare on the driving force. In future the concept of this project is going to be utilized in auto vehicles and no doubt it'll be of great and universally adopted. It also helps us to send an automatic message to the authorized contacts. It sends the google location of the person of the victim who is attacked with an accident. It helps us to rescue the people who are in need.

V. CONCLUSION

This paper presents the automated headlight dimmer that uses LDR. Here, beam is automatically switched to low beam when a of sunshine beam of light from another vehicle falls on the LDR. Glaring of sunshine from the other vehicle during the night travel is one among the main problems. Though there is a manual method to scale back the headlight beam, it will be difficult during some situations. Smart headlight dimmer is employed to scale back the accidents that occur at the already dark thanks to of sunshine beam of light. It is wont to prevent threat caused thanks to Troxler effect. It helps in smooth and safe driving during night times. The component placed in front of the headlight dims the headlight beam without human intervention. It also helps in intimating others about our condition if something accident occurs. The GSM module and GPS module are used to send the messages along with the latitude and longitude of the location.

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