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Smart Street Light with Accident Detection

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ABSTRACT: As urbanization has increased rapidly over the last few decades, city logistics and last-mile logistics have become active fields of research with applications in industry as well as academia. With the increase of road networks and vehicles, traffic congestion has become an enormous problem in all megacities in the world. During rush hours, it is very common for motorists to be stuck in long vehicle queue for several hours. Traffic congestion has huge impact on public health and national economies. However, traffic congestion can be disastrous following a catastrophic event by disrupting the rescue and recovery operation and delaying the transportation of emergency deliveries. This project is automatic switching of Lights and to intimate vehicle movement with the help of GSM Module.

KEYWORDS: Arduino IDE, Embedded C

I. INTRODUCTION

The trend of global urbanization brings about advancement in the digital technologies and design of smart cities. Streetlight technology is one of the trend in the development of smart city. The application of streetlight is crucial and often found in the big or small cities all over the world. Streetlight can provide light at night time to the streets and public places, which can mitigate the probability of accident happening and enhance the safety of drivers and pedestrians. The odds of driving accidents and pedestrians accidents are lower when the streetlights are present. The main purpose of streetlight system is to be able to illuminate the target area such as roadways. Moreover, it also gives psychological effect, which can increase street user's alertness and provide a sense of personal security. The street light controller is a smarter version of the mechanical or electronic equipment previously used for the street light ON-OFF procedure. Energy effectiveness is the main issue when arranging enclosed or open air lighting frameworks. Lighting can represent 10–38% of the aggregate vitality charge in a run of the mill urban areas around the world. Delivering street lighting is considered the major and costly task of a city. Street lighting is mostly a vital issue for civic consultants in developing countries and the reason behind this is tactical standing for communal as well as financial steadiness.

II. LITERATURE SURVEY

India traffic congestion is becoming a very serious issue day after day. The heavy traffic jam is a result of large amount of vehicle which is caused by huge population and development in economy. As a part of globalization, time consumption and management means a lot. The fast moving world in which we live today does not want to wait at any cost in middle of the time consuming traffic signals. As a result of this mentality of the people, safety measures are discarded and violated intentionally. Thus a need for density based time saving traffic signal control unit aroused. The density based system would be better than the time based system control as it scans the density of vehicles on road based on Digital image processing. More accurate and easily maintainable system is what we need. This time saving control system can be used in all frequently congested junctions. The proposed system has two sections; the traffic section and the control section. The vehicle density in the junction is estimated by capturing the traffic condition using digital cameras and processed by MATLAB programming. Based on the captured and processed information on Vehicle density the signal durations can be increased or reduced using microcontrollers.



III. EXISTING SYSTEM

Conventional traffic light system is based on fixed time concept allotted to each side of the junction which cannot be varied as per varying traffic density. Junction timings allotted are fixed, Some times higher traffic density at one side of the junction demands longer green time as compared to standard allotted time. In this system we won't control the traffic and vehicle stolen in the metro cities and also emergency vehicles suffers here.

DISADVANTAGES

- Waiting time in signals are more
- Chances for disobey traffic rules

IV. PROPOSED SYSTEM

In this project, IR sensor is used to detect the Vehicle to Turn ON the Street Light.If it detects the Street Light will glow when the Vehicle detects at the IR Sensor.If the Vehicle gets high movement ,the Vibration Sensor will activated then the SMS along with location will be Send through the GSM Module.Also when the Vibration Sensor goes above the threshold limit Value the Motor also Stops to Stop the Vehicle.Depends upon LDR,the Street Light will glow on Night time.

ADVANTAGES

- Avoid unwanted Power Consumption.
- Accident can be Reduced
- Economical and Important to all Vehicles.

V. REQUIREMENTS

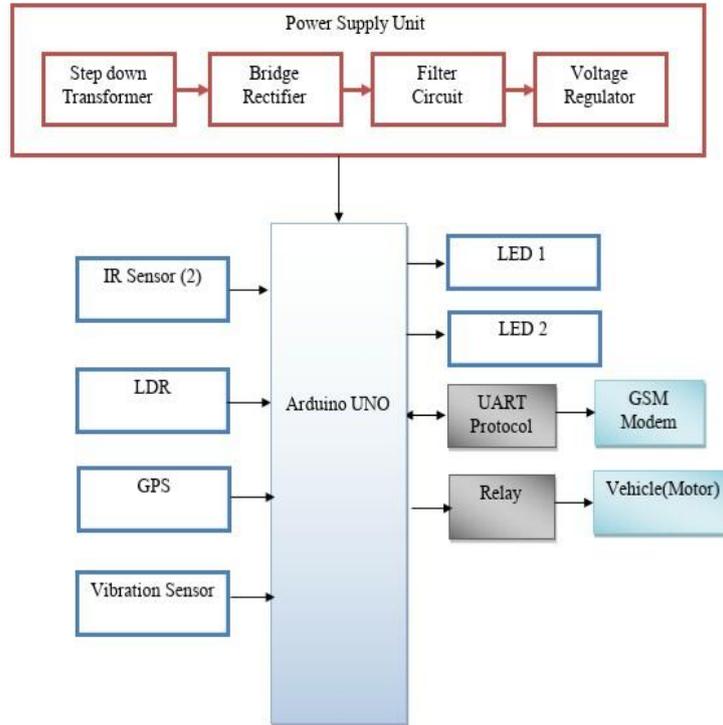
HARDWARE REQUIREMENTS:

- Arduino
- Power supply Unit
- IR sensors
- GSM Modem
- GPS
- DC Motor
- Vibration Sensor
- LDR
- Relay
-

SOFTWARE REQUIREMENTS:

- Arduino IDE
- Embedded C

VI. BLOCK DIAGRAM



VII. EXPLANATION

POWER SUPPLY UNIT:

Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.

STEP DOWN TRANSFORMER:

Basic power supply the input power transformer has its primary winding connected to the mains (line) supply. A secondary winding, electro-magnetically coupled but electrically isolated from the primary is used to obtain an AC voltage of suitable amplitude, and after further processing by the PSU, to drive the electronics circuit it is to supply.

THE RECTIFIER STAGE:

Rectifier circuit is used, to convert the AC input is converted to DC. The full wave bridge rectifier uses four diode arranged in a bridge circuit to give full wave rectification without the need for a centre-tapped transformer.

FILTER:

A typical power supply filter circuit can be best understood by dividing the circuit into two parts, the reservoir capacitor and the low pass filter. Each of these parts contributes to removing the remaining AC pulses, but in different ways.

VOLTAGE REGULATOR:

Voltage regulator ICs are available with fixed or variable output voltages. They are also rated by the maximum current they can pass. Negative voltage regulators are available, mainly for use in dual supplies. Most regulators include some automatic protection from excessive current and overheating.



VIII. CONCLUSION

The result includes Successful implementation of the Street Light and Accident Detection System using IR Sensor and Vibration Sensor with the Sensing Technologies. In Today's Situation this type of Automation Technologies is Needed to Reduce the Accident and Risk. The Power Saving Technology is also Implemented with the help of LDR Sensor.

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