VEHICLE MOVEMENT STREET LIGHT CONTROLLER SYSTEM

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Abstract - Here this model is based on IOT and can be implemented in any campus also in smart cities we are presenting the paper by tracking the vehicle movement in order to save energy by automatically switching the streetlight only when the system detects the movement of vehicles, and the system will on the street light ahead of vehicles and switches off the trailing light simultaneously, if a vehicle stops in between for a longer time inside campus a buzzer beeps in order to indicate to move the vehicle to the correct parking slot and for pedestrians sufficient light will be activated if there is no movement of vehicle thus we ensure that the system saves energy.

*Key Words***: buzzers, IOT, campus, pedestrians

1. INTRODUCTION

The model is implemented in a way that in order to conserve lot of electric power consumption than current system, where the street lights are put on only the vehicle of movement is detected, we have also restricted the vehicles over speed in the campus. Here in this project the movement of vehicle is tracked in the initial street light by IR sensors and detection of vehicle in and out movement of vehicle is recorded and stored in the database. If a vehicle is stopped between longer times a buzzer beep is indicated to move the vehicle immediately in order to save more electricity .We have also implemented the concept of minimal light in the street for the people who use the foot path. We have implemented the advance concept of SOS alert to near police station and fire extinguisher with an emergency call or text and a call, RFID is installed as a security check point.

2. EXISTING SYSTEM

In the existing system, a lot of electricity gets wasted and we can see in municipality a lot of light cost a very high bill. The drivers in the night may not get clear vision in dim lights which cause accidents in urban areas, light pollution can hide the stars and interfere with astronomy and the migration of many bird species.

According to Environment and Energy Study Institute (EESI) a famous non-profit organization that promotes environmental sustainable societies, more energy consumption, as of 2019, globally 70% of all electricity was generated by burning fossil fuel, a source of air pollution and greenhouse gases, here globally there are approximately 300 million street lights using that electricity. Street lights must be switch on/off manually, the requirement of man power is more and also checking and maintenance should be done continuously. Due to the chemical called sodium vapor lamps, more energy is consumed, it is expensive as the light is ON the complete night.

Disadvantages of Existing System
- More Energy Consumption.
- High expense.
- More manpower required for manual switching off/on of Street Lights.

3. PROPOSED SYSTEM

We are implementing a unique idea to overcome the scare city of electric city in India, by this technologies we are more confident enough to overcome this problem, by vehicle movement smart light system we are planning to implement the smart street concept in which the system works by tracking the vehicle movement, there may be a question. "What if a person using a foot path instead of vehicle"? As we found in existing system there was no minimal light for a person's who uses foot path to overcome this problem we are introducing a light sensor to be working with minimal light, and this will get turned off automatically during the day time

We have found that many drivers use their cell phone and keep wasting their time as well as electricity by talking in the same place for more than hour's by parking there vehicle, to overcome this problem we have introduced an buzzer in this project where if the vehicle is standing for more required number of time a buzzer sense it and automatically starts beeping until and unless the car is moved from the current location. we have also introduced manual shutdown concept in order to have a the equipment leave longer without any arm during the bad weather conditions, during this the normal mode is activated and the street lights will be turned on as regularly, since it is a smart street we have retracted the entry for all vehicles to overcome the security issues we have introduced the security check system at the entrance, only the registered vehicles are allowed inside the smart city through the smart street.

4. METHODOLOGY

When a vehicle passes during the day time the light sensor do not work because it is not necessary but when the vehicle passes through night then only light sensors work. This particular model can be implemented in normal street areas as well and even in smart campus by using IOT compatible devices as a security measure. The sensors get activated only when there is motion nearby but if there is no motion light remains dim, if any motion is detected the light intensity become high automatically the above mention ideas can be implemented in any infrastructure to which the light sensors are compatible with. The main purpose of Vehicle Movement Street Light Controller is to on light only when the vehicle detects movement. The street light are operated in automatic mode, here if any human or vehicle movement is detected through the sensors the ultrasonic sensors detects the motion, the motion sensor triggers the microcontroller to turn the LEDs to the full brightness and as the vehicle pass all the street light get restored back to the dimming brightness with the help of the rectifier and regulator.
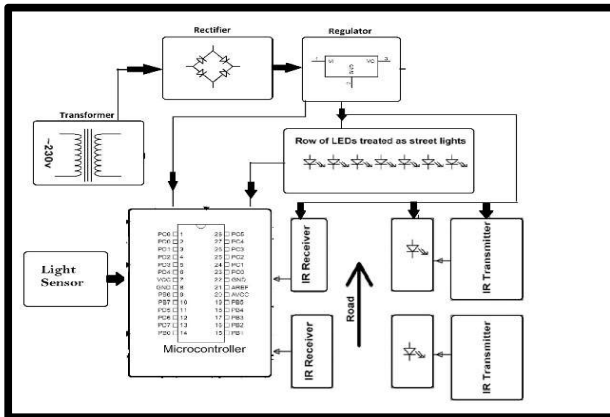

Fig-1: Process of Vehicle Street Light Controller System.

Here in this model transformer is used to pass the electric energy from one circuit to another circuit within milliseconds. A rectifier is a device which converts an AC to DC by allowing the electric current to flow through one direction only. According to above Fig-1 The regulator ensures that the voltage is delivered within certain limits. The IR transmitter and receiver are used to control all devices through network wirelessly. The light sensor act as a passive device that convert the light energy to electric energy and are also known as Photo Sensors because of the conversion of photos to electrons. Microcontroller are used here which is used automatically controlled products and devices such as automobile engine, power tools and embedded systems. Here in this model we are using microcontroller ATMEGA which is of low cost and commonly used in many projects and autonomous systems where a simple powered, less expensive microcontroller is used. Here in addition to save cost the smart street lights help to monitor parking, pedestrian walking along with the buzzer which alerts the driver if they stop the vehicle in middle or wrong area by beeping and warning them to park in allocated slot and also helps the driver to have clear vision while driving and avoid accidents because of the efficiency of high intensity street light.

5. IMPLEMENTATION

By use of this system, we will try to control streetlights from the remote servers. The primary objective is to develop efficient Smart Street Light Systems to provide wireless access for handling it need some Servers which can be used to monitor whole city's street lights. Internet technology with low cost can be used for remote access.
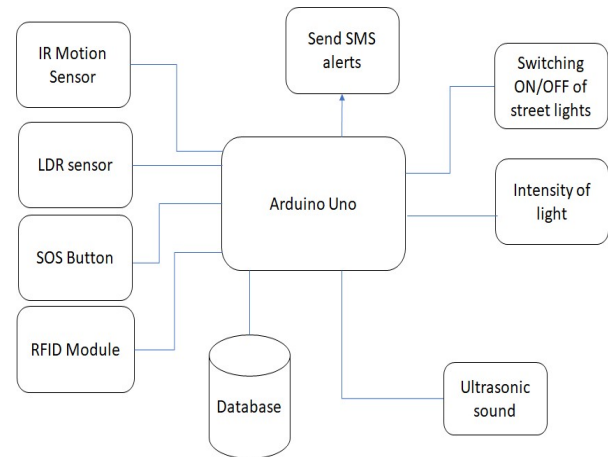

Fig -2: Block diagram

Highways are a boon to the prosperity of a country. They connect places, culture, trade and economy. Making it smart and safe is one the core objectives of the project. In the above fig-2, we will mainly focus on the following core issues Lighting system, Safety, Data collection, Smart card reader for vehicles at the entrance of campus or toll booth, the street lights accounts nearly 30% of a city's power demand. Hence, it's utmost necessary to make it efficient and smart. The project will work on three main features w.r.t lighting system- LDR for automatic dusk/dawn switch ON/OFF of lights and Reducing the intensity of lights when traffic is low Increasing the intensity of lights when there is a movement of vehicle The second one is the safety. An SOS button will be present at every 200mts which will send alerts to nearby police station/hospitals/non-govt organizations for help. The street lights will have ultrasonic sound to keep the stray animals away, thereby preventing them by getting road killed.

Since the smart controller will be connected to cloud, the data like the number of vehicles passing each hour, the number of times SOS button was pressed and the electricity consumption etc can be recorded, analyzed and be used to improve the whole design and process.

ARDUINO:

To have flexible connection without conjunction. And arduino IDE is a software used to develop connection between various sensors and parts, and most of the wireless connection parts are connected through this arduino and by this arduino some alert messages and E-mail can be sent, thus arduino is one of the latest technology which can be easily adopted.

INFRARED SENSORS (IR):

Are made to be placed near the street light and exactly opposite to this IR receivers are placed to track the movement. Of both pedestrian's users and vehicle users, by this IR the buzzers get activated if the vehicles are in the same position for longer time in order to save electricity the buzzer beeps loudly indicating to move vehicle immediately.

LIGHT SENSOR'S (LDR):

To control the intensity of lights by detecting the movement of vehicle and pedestrians. If there is no vehicle movement is detected the light intensity will be 30% and if vehicle movement is detected the light intensity is increased to 100% this process id continued throughout until the light sensor detects the changes from night to day. During day time the complete unit will be shut down, and during night time I gets activated automatically
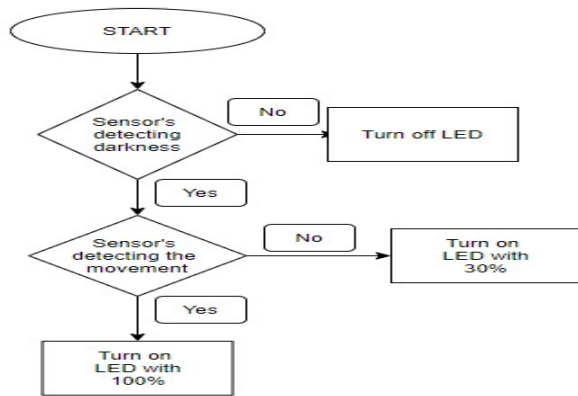

Fig-3: Flow chart

As mention mention the above Fig 3 we are discussing the complete reprecentation of our project once the system is started it detects for dark light if not found then Led is not invoked. If the sensor detectes the dark in night and if its detect the vechile movemt then the LED is invoked at 100% and if it is not detucted the LED is invoked only 30% of the actual ratio thus the street lights are turned on and off and the process continous with accuarte results

SOS BUTTON:

Is an emergency button used to protect the theft and acts as instant solution in order to provide more safety in smart street and smart campus. Once SOS is activated the message is sent to the nearest police station and not only message an instant call be connected so that the process can get faster to avoid theft.

RFID MODULE:

It's a latest innovation which a smart cities and smart campus can adopt, this basically works as the smart gate by which it detects the RFID tag and once it's scanned successfully the vehicles can enter or entry will be restricted, if not registered the have to register their vehicle number by using the website.
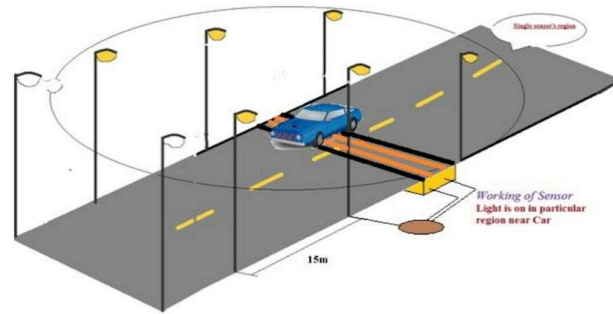
6. RESULTS AND DISCUSSION

Fig-4: shows the function, when the vehicle passing is in the road. The streetlights are switched ON when the vehicles Working of sensors and activating the LED lights

We have designed the model in such a way that the infrared sensors are made to be placed near the street light and exactly opposite to this we have introduced light sensor's to control the intensity of lights. As we discussed in proposed system we need to focus on both the street users who utilizes this road facilities by human beings and vehicles, and the rest is taken care by the system on altering the intensity of lights and manage the problem in short term period.

We have also introduces the unique way of Turn on / Turn off of the street which can be controlled manually from the security check and it has been design in such a way that it is quit flexible when it comes to the requirement of users

Street lights	When no vehicles detected	pedestrians movement detected IR1, IR2	Vehicle's movement detected IR1, IR2
L1	—	30%	100%
L2	—	30%	100%
L3	—	30%	100%
L4	—	—	—
L5	—	—	—

Table -1: Simple Table of Street Lights Activation according to the Movement base IR Sensor deduction.

After this process the streets are made to observe the condition of the intensity of both formatted LED lights depending on the usage of the streets. Also the newly expanded unit can be turned off if it's not required, Streets are took at most care during the daylight and depending the weather forecasted report the system are made to active or shut it down, and manually the normal mode is been activated

Charts
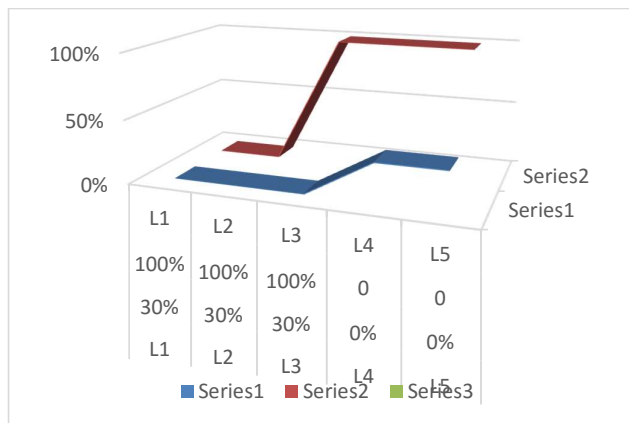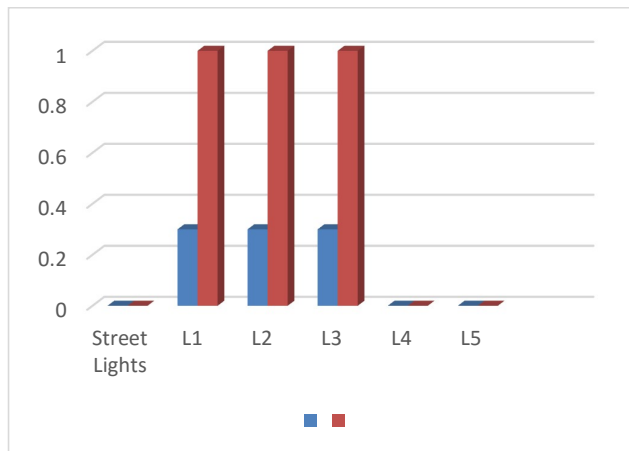
The system is also designed in terms of modular system, in which it can be easily extendable. By measuring the usage of the system on a street and can be implemented at any time by expanding the given connection and with low cost at any flexible time.

7. CONCLUSION

Finally we conclude that by taking a one step forward we are introducing the E-street concept which reduce the wastage of electricity in street light and also wastage of electricity in many industries through street light, Since we have used the light sensor if there is no vehicle movement is not found and the dimming lights for foot path users will allow them to walk efficiently, this saves energy by preventing more wastage of power compared in other existing system., since we also introduced the manual shutdown option this system will be shut down if it's not in use and this may be upgraded in feature also. Thus this system is more versatile and flexible to user requirement

ACKNOWLEDGEMENT

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