



e-ISSN: 2278-8875

p-ISSN: 2320-3765

International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

Volume 11, Issue 6, June 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.18

☎ 9940 572 462

☑ 6381 907 438

✉ ijareeie@gmail.com

@ www.ijareeie.com



Smart Street Light and Automatic Fault Detection Management System

S.Sivasakthi¹, D.Dhanishbabu², B.Athavan²

Professor, Dept. of EEE, Krishnasamy College of Engineering & Technology, Cuddalore, Tamilnadu, India¹

UG Student, Dept. of EEE, Krishnasamy College of Engineering & Technology, Cuddalore, Tamilnadu, India²

ABSTRACT: The IOT (Internet of things) is a blooming technology that mainly finding the faulty street light automatically is become a vital milestone by using this technology. The primary goal of the project is to provide control and identification of the damaged street light automatically. The lighting system which targets the energy and automatic operation on economical affordable for the streets and immediate information response about the street light fault. In general, the damage of the street light is observed by getting the complaints from the colony (street) people. Whereas in this proposed work using LDR sensors these lights working status is easily captured without any manual interaction. So that it reduces manual efforts and the delay to fix problems. So, to reduce such problem we come with the solution where in automatic detection of street lights issues, whether the street light is working or not will be found at night time and it should send the notification to the authorized person if there is a problem in particular street light and also the location are automatically ON/OFF using IOT. In this system, it checks whether the street lights automatically, Based on the condition of the weather.

KEYWORDS: Atmel, Transformer, GSM Module.

I.INTRODUCTION

We all are living in 21st century now and the population growth is increasing in a sharper rate. As the population is increasing day by day the chances of accident occurring is also increasing. Prevention of this meeting accidents are of great concern today. The main cause of all these accidents are negligence, negotiation of safety measures etc. As technology is getting advanced in a greater speed safety measures also being modified but still accidents are still happening. Earlier various steps were taken to prevent those accidents but still accidents were occurring at a higher rate. GPS (Global Positioning System) and GSM (Globalization Management System) were introduced but both of these were useful after accidents had happened as GPS is used to give information regarding the location and GSM is useful for sending messages from the users mobile to indicate the authority that accident happened.

GPS and GSM are used for indicating that accidents occurred but our proposed model is an exception to all this as it prevents the accident from occurring and thus saving lives. Our proposed model is an indication system that indicates accident may occur so that we can take necessary measures to avoid these accidents. Thus this is a one step towards lifesaving and it's also on we humans how we take care of our own safety as safety comes along with us.

There are many existing plans towards safety against road accidents like due to advanced technology GSM and GPS were introduced so that they are helpful in tracking the vehicles that met with an accident but they are not preventive for avoiding the accidents. Arduino based vehicle accident detection system was proposed as an approach towards avoiding road accidents. In this proposed model Arduino, GSM, GPS, LCD, vibration sensors were used. In this system vibration sensor is used as an input source to system which is analyzed by the Arduino and when the sensor reading exceeds the normal or threshold appropriate action starts taking place as it will direct the GSM to send messages from the user mobile to the authority as they can send immediate help to the accident victims.

Next approach was made by accident control system using ultrasonic sensor. Ultrasonic sensors were used along with controller and Arduino to prevent the accident from occurring. Buzzers and lamps are placed on both the side of the roads along with controller and ultrasonic sensors. The ultrasonic sensors senses from where the vehicles are coming and accordingly the controller sends signals and accordingly buzzers will ring and the lamps will glow to indicate that vehicles are coming from the other sides and thus saving the vehicles from meeting with an accident. Various measures were also taken by the government to reduce the chances of accidents on the turnings by providing glasses so that vehicles coming from the other sides are aware of coming vehicles.



II.LITERATURE SURVEY

- R. Zambare, P. Pawar, P. Jadhav proposed a the latest trend in the technologies related to wireless communication has led to the emergence of several engineering designs for human requirements. The creeping interests in the wireless and GSM based projects, we came up with this idea of developing a simpler, multipurpose, cost- effective design to control the on-off street lights via short message service (SMS). Commands are sent to street light for night lighting Applications system through user' mobile as data through SMS (Short Service Messages) providing a cost effective, reliable far reaching access to the user. The coded SMS is sent to the light relay system to base station controller that receives the messages, decodes the messages, initiates required automation operations and responds to the successful initiations by a reply to the user.
- Akash RB, Holabasappa K, Kiran Kumar DM, Kiran presented a the objective of the project is to provide automatic control and monitoring on street light. The project deals with designing a lighting system which targets the energy saving and autonomous operation on economical affordable for the streets and immediate remedy on complaint. The Energy Consumption of street light of a specified area can be recorded and accounted on Energy Saving Lighting System with integrated sensors and controllers. Moreover, errors which occur due to manual operation can also be eliminated. Also the street lights can be switched ON/OFF through computer from central control station or can be automated using light sensors embedded in the street light pole circuit of the application. With these facilities the performance and life of the lamps will be increased. The application is based on client server model.
- Swati Rajesh Parekar; Manoj M. Dongre proposed a street light is a raised source of light that is commonly used along walkways and streets when the surrounding turns dark. Nowadays, most of the existing street light systems are wired which are not only difficult to construct but also has poor flexibility. To overcome this, wireless system is required. In this paper, we are using GSM technology which uses power efficiently by remotely monitoring and controlling the system. This system will ease the fault detection and maintenance. System allows us to make the most efficient use of the energy received from the sun to power street lights. Solar energy is collected with the aid of solar panel and battery is charged during day time and this energy is used to power street lights during night. Developed intelligent system turns the light ON and OFF depending on the vehicle or pedestrian movement, Real Time Clock and light intensity at the same time. Microcontroller processes the information from the sensors and is transferred to nearby control terminal (Base station with Raspberry PI as a compute module) to monitor the status of the street lamp using GSM technology via Short Message Service (SMS). Designed system is visualized by creating Graphical User Interface (GUI). Thus, the implementation of such system will result in energy saving, lower cost of maintenance, increased lifespan and hence the enhanced performance of the system.
- Surendran,Gowdhaman presented a the street light system is checking the weather for street lamp ON/OFF condition. The weather is light or dark are sense through a LDR sensor, If the weather is light, the system will OFF. If the weather is dark, the light system will ON. After the light on the light condition also check through LDR sensor for light glow or not glow status. If light is not glowing, the sensor sends the value to street light system. The street light system will generate message and send SMS to ward member and ward serviceman mobile number through GSM. At the same time the sensor values are stored in cloud server. We can access the light system data in cloud anywhere and anytime.



III. PROPOSED SYSTEM

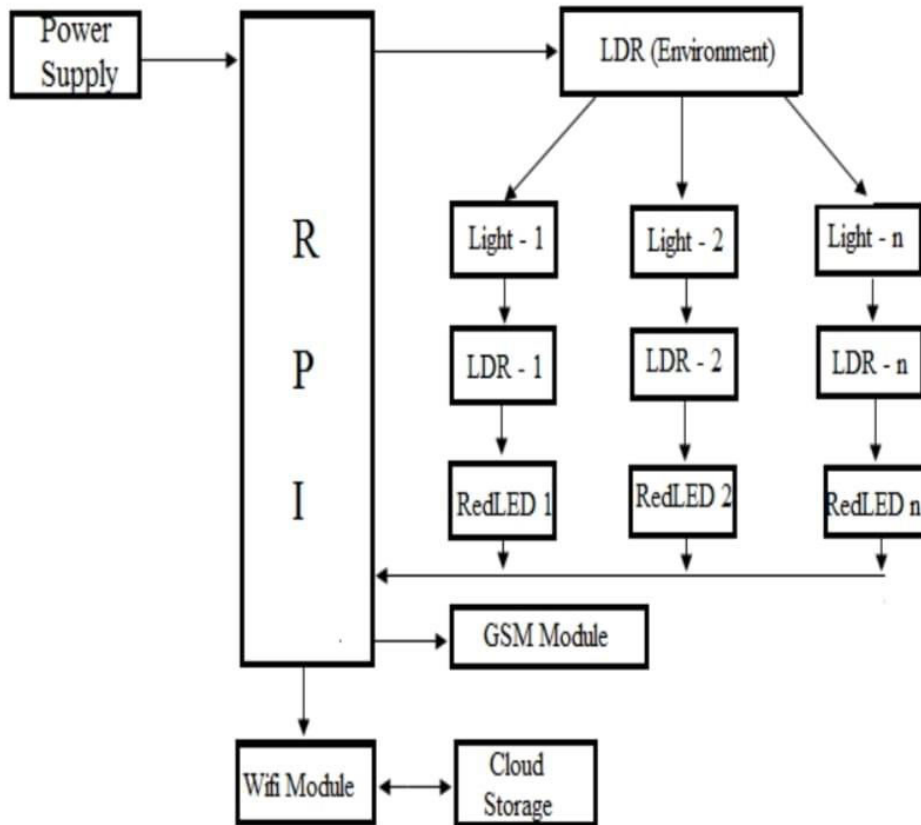


Fig. 1 Block diagram of the proposed system

Fig.1 shows the proposed system consists of ATmega, transformer, voltage regulator, LED and GSM module. In the research of the damaged Street Light identification System, we will identify the reduction in power consumption. According to our modern lifestyle energy is the basic requirement for both developing and developed countries. For better understanding, we build a prototype for street lighting to find the effectiveness of our system. This research work covers all reviews from various sources, which targets different concepts of street light systems and risks of human effort. In this work, we discuss two important concepts and get unique results effectively. The proper operation of the system of street lighting by the addition of other systems will help us to develop a research work which is easy and also consumes less power and cost, which can be accessed by the internet. The driver architecture of LED is everywhere to design a street light system in a smart way, which is reliable and reduces energy waste. They undoubtedly describe the automatic ON/OFF of the lights automatically.

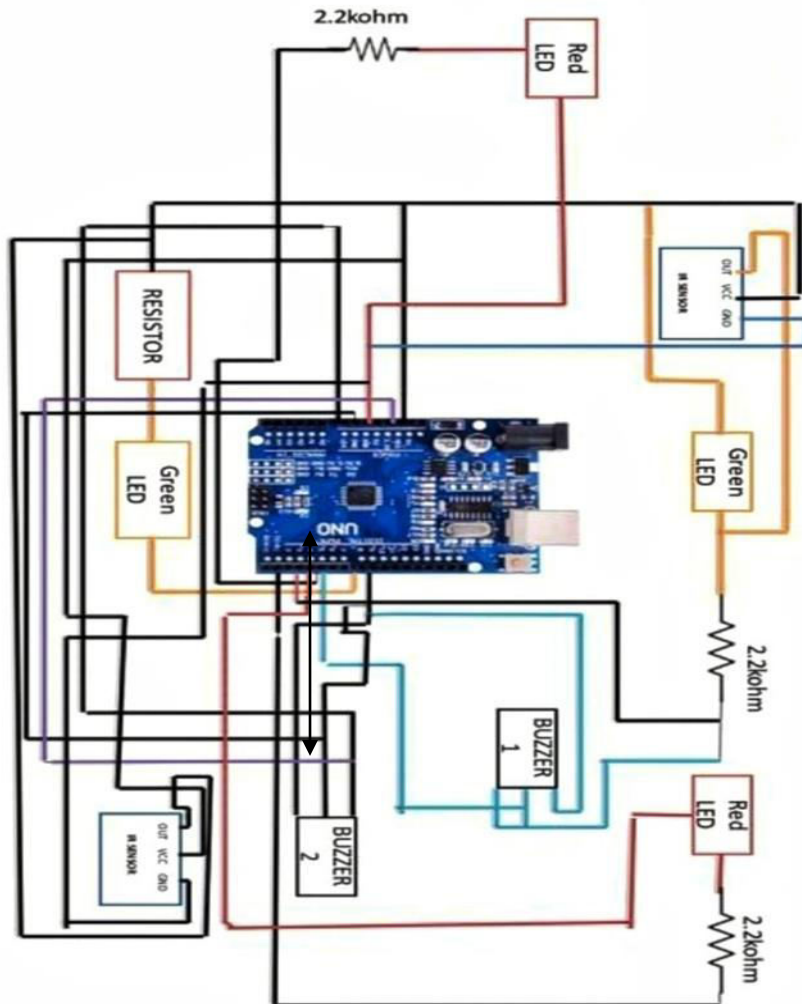


Fig.2 Equivalent circuit of proposed system

Fig.2 shows the circuit diagram of design of Smart Street Light and Automatic Fault Detection Management System. The components used are ATmega, transformer, voltage regulator, LED and GSM module works as a main function. Initially, the LDR checks whether the light of the atmosphere is ON/OFF. No action is performed if it is in the ON state. If the weather's state is OFF, then automatically the light of the street will become ON. If there is any fault in the lamps of the street the red LED attach to each street light, will be ON. Here the color red indicates the damage. Each street light contains their respective LDR and red LED, this LDR is used to sense the street light and ON the red LED automatically, in case of a faulty lamp. The location will send to the authorized person through the Twilio account. The Twilio Account is cloud storage, which stores the data. The description of the message and the mobile number of the authorized person is attached to this. At the time of fault detection, this message will send to that person. The exact location will be fetched through the GPS. These contains several forms of data, but in our project, we are using Bluetooth data which consists of longitude and latitude of the faulty light. After fixing the damaged lamp, the red LED will get OFF automatically.



IV. WORKING PRINCIPLE OF PROPOSED SYSTEM

The Internet Of things are ready to implement transparently a really great amount of the heterogeneous end systems, while digital service provides open access to subset of the knowledge. The main focus is an smart street lightning system. During this system the road light systems are automatically ON and OFF in keeping with true. The Atmega is employed to regulate the method. It's focussed on controlling intensity of the sunshine considering the thing movement near the sunshine. Two different sensors named Light Dependent Resistor and Pyro-electric sensors are used. Once if the sun light goes under the visible region then this technique automatically switches light ON. As soon because the sun light is visible then automatically switches OFF lights.

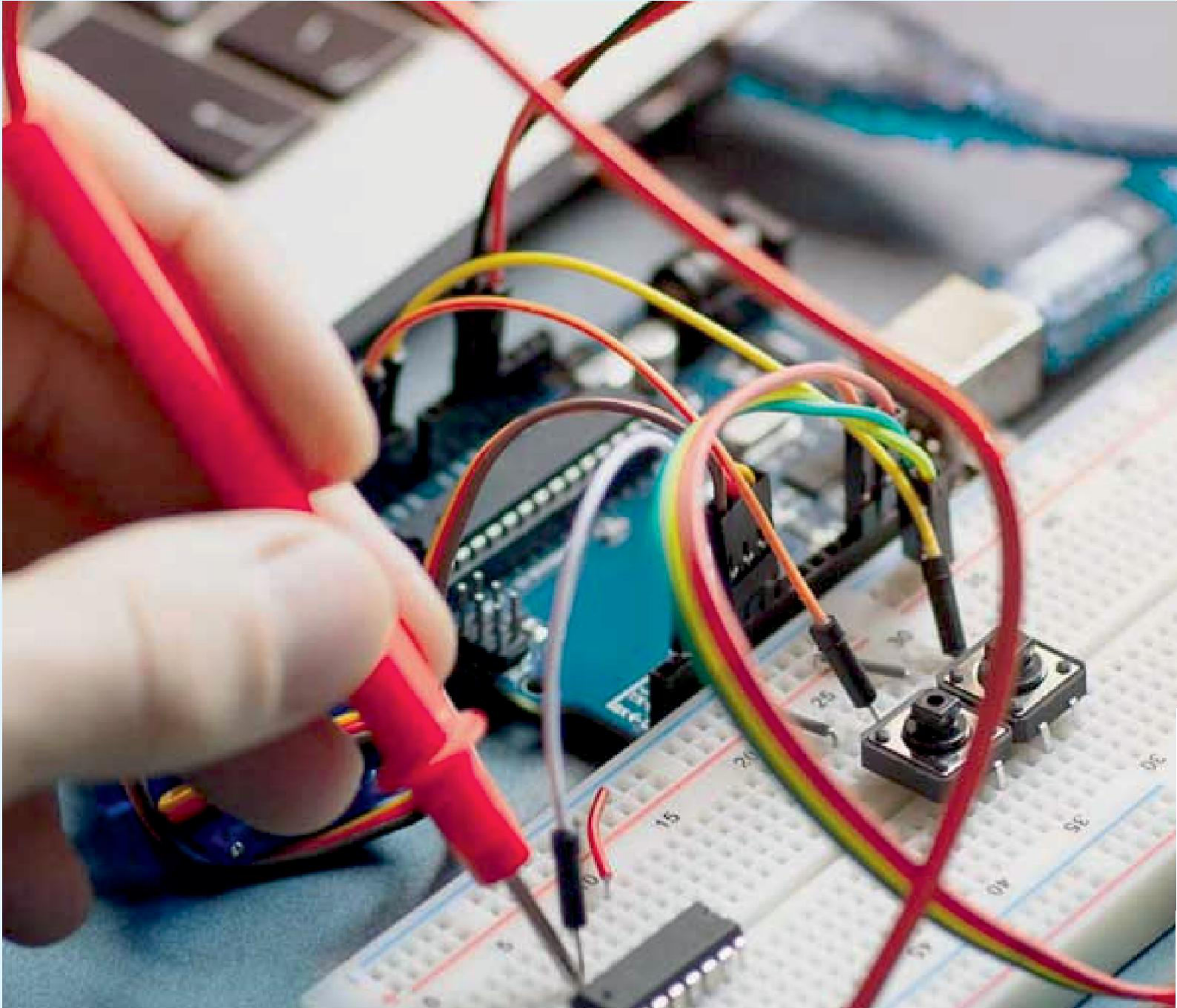
V. CONCLUSION & FUTURE ENHANCEMENTS

An automatic street light control and fault detection system with cloud storage in this paper, control the street light ON/OFF automatically depends on the environment situation and we can easily identify the light faults in this system easily and also the system sends alert message to the authorized person's mobile numbers. We can monitor the system anywhere and anytime via cloud storage system. This system is very useful to Municipal Corporation. In, Future we will find the sensor's faults and power supply faults in the system and also we will control the light power adjustment depends on the environment.

The automatic control of street lights is used to find the exact location when the street light gets damaged. Further, this can be implemented for all the street lamps in rural lamps. Pre-identification of damaged street lights is done based on the expiry of lamps

REFERENCES

- [1] Mr. Amey J.Manekar, Dr. Dr. R .V. Kshirsagar ” Design and Implementation of Automatic Street Light Controller for Energy Optimization Using FPGA”, International Journal of Advanced Research in Computer and Communication Engineering Vol. 5, Issue 6, June 2016.
- [2] Chaitanya Amin, AshutoshNerkar, Paridhi Holani, Rahul Kaul ”GSM Based Autonomous Street Illumination System for Efficient Power Management” International Journal of Engineering Trends and Technology- Volume4Issue1- 2013.
- [3] Abdul Latif Saleem, Raja Sagar R, Sachin Datta N S, Sachin H S,Usha M S “Street Light Monitoring and Control System” International Journal of Engineering and Techniques - Volume 1 Issue2, Mar – Apr 2015.
- [4] K.Y.Rajput, Gargeyee Khatav, Monica Pujari, Priyanka Yadav” Intelligent Street Lighting System Using Gsm” International Journal of Engineering Science Invention Volume 2 Issue 3 , March, 2013.
- [5] V.Sumathi, A.Krishna Sandeep, B.Tarun Kumar “Arm Based Street Lighting System with Fault Detection” International Journal of Engineering and Technology- Vol 5 No 5 Oct-Nov 2013.IJSER.
- [6] International Telecommunication Union.(2005). Internet reports 2005: The internet of things. Geneva: ITU.
- [7] Issarny, V., Teixeira, T ., and Hachem, S. and (2011). Ontologies for the internet of things (pp. 1–6). New York: ACM.
- [8] Suo, H., Wan, J., Li, F., and Yan, H. (2011). “Advances in cyberphysical systems research”, KSII Transactions on Internet an Information Systems, 5(11), 1891–1908.
- [9] Vasilakos, V., Lai, C., and Tsai, C.(2014). “Future internet of things: Open issues and challenges”. ACM/Springer Wireless Networks.
- [10] Morabito, G., Iera, A., & Atzori, L. and (2010). “The internet of things: A survey,” Computer Networks, 54 (15), 2787–2805.doi: <https://doi.org/10.1016/j.comnet.2010.05.010>.
- [11] Miorandi, D., Chlamtac, I., Pellegrini, F. D., and Sicari, S. (2012). “Internet of things: Vision, applications and research challenges”, Ad Hoc Networks, 10(7), 1497-1516.



INNO  SPACE
SJIF Scientific Journal Impact Factor

Impact Factor: 8.18



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

 9940 572 462  6381 907 438  ijareeie@gmail.com



www.ijareeie.com

Scan to save the contact details