VEHICULAR COMMUNICATION SYSTEM FOR ANTI-COLLOSSION USING LI-FI

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ABSTRACT: Vehicle to vehicle data broadcast, we proposed design and results of a prototype system using light fidelity (Li-Fi) technology. The Li-Fi is a new technology which is established in the last few years. Vehicle to vehicle message is the most effective solution in order to reduce vehicle's accidents. In Li-Fi technology for vehicle-to-Vehicle data communication we used LED bulb as transmitter and photo detector as a receiver. In this system there is elimination etiquettes use so in Li-Fi technology intricacy get reduce. The aim of designing this system is highly consistent which give desired data programme between vehicle-to-Vehicle by using transmitter and receiver straddling on vehicle.

Keywords— Light Discharging Diode, Photodiode, Vehicle to Vehicle Message, Visible Light Message, etc.

I INTRODUCTION

Harald Haas was developed LI-FI and promoted LI-FI in his 2011 TED World-wide talk by giving Presentation of an LED light bulb to transmit a data with the speed 10 times more faster. As the speed of light is very high so the data transmission speed via the light is also high. Relocation of data from one place to further is one of the most significant day -to-day actions. When the multiple devices are related to the current wireless networks that connect us to the internet are very slow. As the number of devices growing the internet access, the fixed bandwidth which is accessible makes it more and more difficult to utilize high data transfer rates and connect to a network. But, radio waves are unbiased a minor part of the spectrum obtainable for data transfer. A solution to this problem is by the use of the proposed system. Li-Fi is transmission of data through light by sending data over an LED bulb that varies in intensity faster than the human eye can follow and the faster data transmission speed system

In modest terms, Li-Fi can be thought of as a light-based Wi-Fi. That is, it uses light in its place of radio waves to transmit material. And in its place of Wi-Fi modems, Li-Fi would use transceiver close-fitting LED lamps that can light a room as well as transmit and receive information. Later simple light bulbs are charity, there can technically be any number of admission points.

This technology uses a part of the electromagnetic spectrum that is still not greatly applied- The Visible Spectrum. Light is in fact very much part of our lives for millions and millions of years and does not have any major ill outcome. Moreover there is 10,000 times more space available in this spectrum and just plus on the bulbs in use, it also multiplies to 10,000 times more obtainability as an infrastructure, globally. It is possible to encode data in the light by varying the rate at which the LEDs flicker on and off to give different twines of 1s and 0s. The LED intensity is modulated so rapidly that human eyes cannot poster, so the output appears constant. More sophisticated techniques could dramatically increase VLC data rates. Focusing on parallel data transmission using arrays of LEDs, where each LED transmits a different data brook. Other groups are using mixtures of red, green and blue LEDs to alter the light's frequency, with each frequency encoding a different data channel.

Li-Fi, as it has been dubbed, has already reached blisteringly high speeds in the lab. Researchers at the Heinrich Hertz Institute in Berlin, Germany, have touched data rates of over 500 megabytes per second using a standard white-light LED. Haas has set up a spin-off firm to sell a user VLC transmitter that is due for promotion next year. It is capable of transmitting data at 100 MB/s - faster than most INDIA broadband contacts.

II. RELATED WORK

M. M. Jaishree et al.[1] described vehicle to vehicle communication using li-fi technology. the transmission of data from one vehicle to another is done in a very easier by Li-Fi technology by using led light. Thus this method will help us to avoid road accidents. In future this data transmission using Li-Fi technology will be promised to play a vital role in human‟s life. Here in this report we are going to sort out the problem like speed and jamming in WI-FI by using LI-FI technology. Lokesh S et al. [2] described a lifi based data transmission for anti collision system This paper proposed a new technique of communication between vehicles which is reliable and simple compared to existing ones and also cost efficient. The main aim is to reduce accidents isnd to provide safer transportation which we have implemented in this system. LIFI technology makes vehicles to communicate with each other and prevents the accidents by applying the braking system.

Sushma L. Wakchaure et al. [3] described overview of Li-Fi Technology. Li-Fi has great potential in wireless data transmission field. It offers tremendous scope for future innovation and research instead of it still in its incipient stages. Every bulb can be used as a Wi-Fi hotspot for transmitting wireless data if Li-Fi technology put into practical use. This technique will help to create the cleaner, safer, greener and a resplendent future. K. Kalidhas et al. [4] described implementation of Li-Fi Technology for Home Automation and Vehicle Communication. concept of Li-Fi had been introduced along with existing techniques and classical trends used for vehicle to vehicle communications and for home automation purpose . As this project aims to propose a cost effective solution to reduce accidents and home automation, the design guidelines and details of system components were thoroughly explored.Shubhankar Mali et al. [5] described Vehicle to Vehicle Communication System Using Li- Fi Technology the concept of Li-Fi had been introduced along with existing techniques and classical trends used for vehicle to vehicle communications. As this project aims to propose a cost effective solution to reduce accident. Mr. Jagdish A. Patel et al. [6] described Li-Fi Technology-Vehicle to Vehicle Data Transmission. The concept of Li-Fi will introduce along with existing techniques and classical trends used for vehicle to vehicle communications. In this project aims to propose a cost effective solution to reduce accidents in Oman, the design guidelines

Ashwini Bagwe et al. [7] described Li-Fi: Data Transmission Using Light. Many cars already LED lamps. Traffic signage, traffic lights, and street lamps are adopting the LED technology so there are massive applications opportunities here.   E. Premkumar et al. [8] described intelligent Transport System Implementation on VANET Using Visible Light Communication (LIFI.) The deployment of inter vehicular communication networks is rapidly increasing. This paper has advantages over the other existing system in terms of response time and independency on external infrastructure. It is also cheap in terms of cost and reliable when tested in actual environment. The system does not intend to notify other running vehicles except the ones that are following it or is in the Lambert Ian line of sight of the array of IR transmitter lined in the rear bumper. Hence it effectively helps in reducing the accidents due to human errors by alerting the driver in advance.

III.PROPOSED SYSTEM

Li-Fi or Light Fidelity refers to 5G Visible Light Communication systems using light-emitting diodes as a medium to high-speed message. It is capable of transmitting data at 100 MB/s - faster than most INDIA broadband influences.it uses light as an alternative of radio waves to convey info. And instead of Wi-Fi modems, Li-Fi would use transceiver fitted LED lamps. To transmits information, it uses radio waves instead of light. And in its place of Wi-Fi modems, Li-Fi would use transceiver close-fitting LED lamps. The LED intensity is modulated so rapidly that human eyes cannot notice, so the output seems constant.
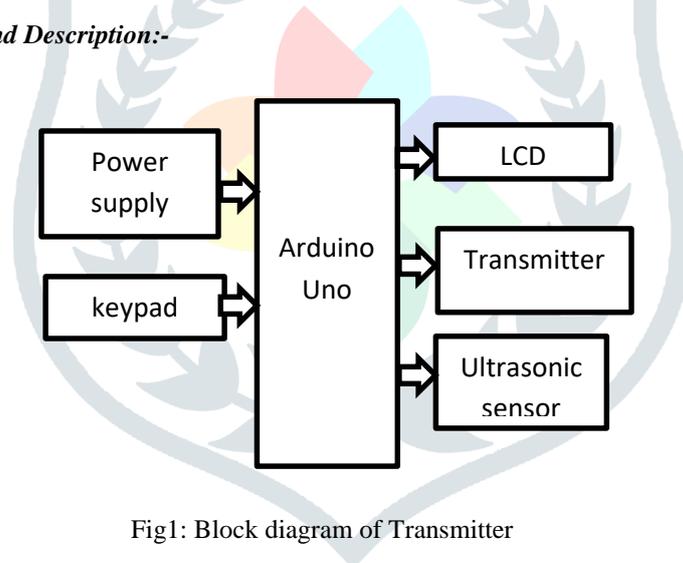
Block Diagram of System and Description:-
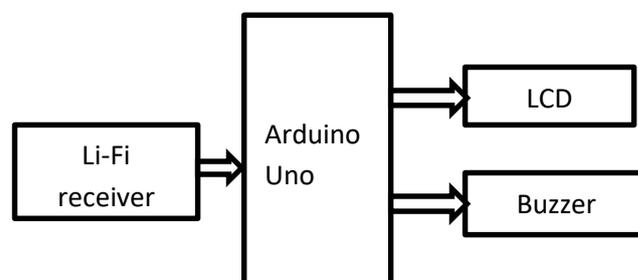

Fig1: Block diagram of Transmitter

Fig2: Block diagram of Receiver

4.1 ARDUINO UNO:-

Arduino is the heart of the proposed system. The Arduino Uno is an open source microcontroller board based on microchip ATmega328 microcontroller and developed by arduino.cc. The board equipped with sets of analog and digital I/O pins that may be interfaced to various expansion boards and other circuits.

4.2 ULTRASONIC SENSOR:

Ultrasonic transducer allows for alternate transmission and reception of sound waves. The transducer emits a number of sonic waves which are reflected by an object, back to the transducer.

4.3 Li-Fi Transmitter**:**
Receives the information from the controller and it modulates the data to light signal and transmits to the receiver section. The transmitter part modulates the input signal with the required time period and transmits the data in the form of 1's and 0's using a LED bulb. These 1's and 0's are nothing but the flashes of the bulb.

4.4 LCD

   LCD is used as an area of a venture to imagine the yield of the appliance. we've used sixteenx2 LCD that demonstrates 16 segments and a couple of lines. Thus, we will compose sixteen characters in each line. during this method, add up to thirty two characters we will show on 16x2 LCD. LCD will likewise use in a very venture to visualize the yield of varied modules interfaced with the microcontroller. on these lines LCD assumes a necessary half in a very venture to examine the yield.

4.5 BUZZER**:**
     A buzzer or beeper is a signalling device, usually electronic, typically used in many household appliances and automobiles It is an electrical device that make a buzzing noise and is used for signalling

4.6 Li-Fi RECEIVER:
         Receives the modulated information from the transmitter section and demodulates the signal in order to recover the original data. The receiver part catches these flashes using a photodiode and amplifies the signal and presents the output.

V. SOFTWARE (ALGORITHM &FLOWCHART):
5.1 ALGORITHM for Transmitter
   Step 1: Start.
   Step 2: Sense the parameter
   Step 3: Read the parameter.
   Step 4: If distance is safe then go to step:6 otherwise go o step:5
   Step 5: Buzzer ON
   Step 6If overtake then go to step:7 otherwise go to step:3
   Step 7: Send message through transmitter
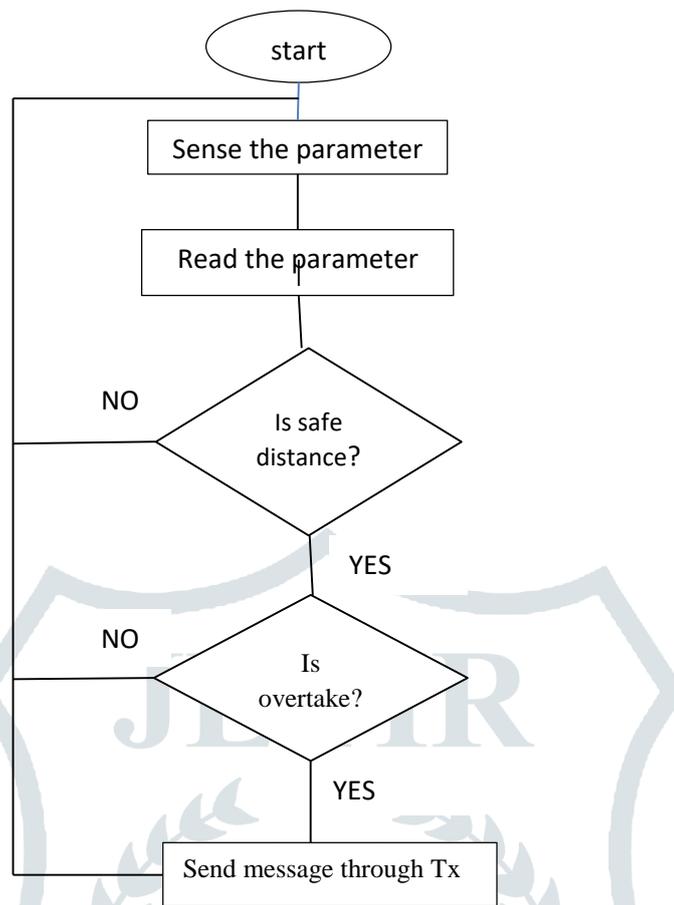   Step 8: Go to step:3`
   .

5.2 FLOWCHART FOR Transmitter:

Fig3:- Flowchart of Transmitter

5.3 ALGORITHM FOR Receiver:

Step 1: Start
Step 2: If message is received then go to step 3 otherwise go to step 2
Step 3: display message on LCD.
Step: 4 Buzzer on
Step: 5 Go to step 2.

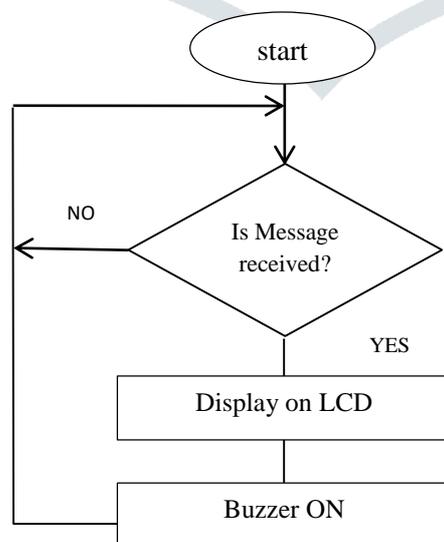### 5.4 FLOWCHART FOR Receiver:

Fig4:- Flowchart of Receiver

Conclusion

In place of using Wi-Fi we uses Li-Fi, it contents the obligation of side-stepping the accidents and also helps to provide the essential information from the behind vehicles whether it may be about fuel leakage or about to overtake. Using the Li-Fi technology we can convey data with high speed. Researchers are emerging a micron size LED's 1000 micron sized LED can fit into an area obligatory by 1sq.mm big single led. Every bulb can be used rather like a Wi-Fi hotspot to transmit wireless data.

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