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Inter Vehicular Communication Using Li-Fi

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Abstract*: *Inter-vehicular communication system provides early warning signals to reduce road accidents and simultaneously provide safe driving. For this purpose we use co-operative driving which enables vehicles to communicate accident related messages to each other. Two modules consist of a transmitter and receiver. In transmitter there is ultrasonic sensors and a LED bulb which is responsible for transmitting data. The receiver module consists of micro controller, an ultrasonic sensor and photo diode which is responsible for receiving signals. This static system provides safety of drivers and reduces road accidents using co-operative driving. It also provides safety of neighborhood.

***Keywords*: *Embedded System, Li-Fi transmitter, Li-Fi receiver, PHP, MySQL, Android Studio, Eclipse*.**

I. INTRODUCTION

In basic terms, Li-Fi can be thought of as a light-based Wi-Fi. That is, it utilizes light rather than radio waves to transmit data. Also, rather than Wi-Fi modems, Li-Fi would utilize handset fitted LED lights that can light a room and additionally transmit and get data. Since basic lights are utilized, there can in fact be any number of access focuses.

This innovation utilizes a piece of the electromagnetic range that is as yet not enormously used The Visible Spectrum. Light is in truth particularly part of our lives for many years and does not have any real sick impact. Additionally there is 10,000 times more space accessible in this range and simply relying on the knobs being used, it likewise increases to 10,000 times greater accessibility as a framework, comprehensively. It is conceivable to encode information in the light by fluctuating the rate at which the LEDs flash on and off to give diverse series of 0s. The LED power is tweaked so quickly that human eyes can't see, so the yield seems steady

More advanced systems could drastically build VLC information rates. Concentrating on parallel information transmission utilizing varieties of LEDs, where each LED transmits an alternate information stream. Different gatherings are utilizing blends of red, green and blue LEDs to change the light's recurrence, with every recurrence encoding an alternate information channel.

Li-Fi, as it has been named, has just accomplished blisteringly high speeds in the lab. Scientists at the Heinrich Hertz Institute in Berlin, Germany, have achieved information rates of more than 500 megabytes for each second utilizing a standard white-light LED. Haas has set up a turn off firm to offer a purchaser VLC transmitter that is expected for dispatch one year from now. It is equipped for transmitting information at 100 MB/s - speedier than most INDIA broadband associations.

II. GOALS AND OBJECTIVES

A. Goals

1) Provide cooperative design to improve the safety for user.

2) To reduce power consumption, and provide wide range of bandwidth.

B. Objective

1) The main objective of this project is to design/develop a module for communication between two vehicles and to maintain safe distance between vehicles to avoid accidents

2) This LI-FI technology for inter vehicular communication will result into adaptive driving.

III.MOTIVATION

A. LI-FI is a term of one used to describe visible light communication technology applied to high speed wireless communication.

B. LI-FI is ideal for high density wireless data coverage in confined area and for relieving radio interference issues.

C. Operating frequency is in Terabytes which is much greater than that of any other technology.

D. The technology removes limitations that have been put on the user by the Wi-Fi.

E. There cannot be anything better than this technology.

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IV. LITERATURE SURVEY

Li-Fi remains for Light-Fidelity. Li-Fi is transmission of information utilizing noticeable light by sending information through a LED light that fluctuates in force quicker than the human eye can take after. On the off chance that the LED is on, the photograph finder enrolls a parallel one; generally its a parallel zero. This paper Rahul R. Sharma, Akshay Sanganal, Sandhya Pati "Usage of A Simple Li-Fi Based System" manages the usage of the most fundamental Li-Fi based framework to exchange information from one PC to another. The fundamental segments of this correspondence framework are high splendor LED which goes about as a correspondence source and silicon photograph diode filling in as the getting component. The information from the sender is changed over into transitional information portrayal, i.e. byte organize and is then changed over into light signals which are then discharged by the transmitter. The light flag is gotten by the photograph diode at the collector side. The turnaround process happens at the goal PC to recover the information over from the got light.

1) In this paper comprises mainly light-emitting diode (LED) bulbs as means of connectivity by sending data through light spectrum as an optical wireless medium for signal propagation. In fact, the usage of LED eliminates the need of complex wireless networks and protocols.

2) In this work, the concept of Li-Fi had been introduced along with existing techniques and classical trends used for vehicle to vehicle communications. The proposed system has a cost effective solution to reduce accidents.

3) This paper focuses on LiFi as a feasible complement to the existing RF based communication. For this purposes, we thoroughly analyzed the difference between VLC and LiFi, the issues in RF based communication that can be addressed by LiFi, the working mechanism of LiFi, its pros and cons and finally we studied the application of LiFi.

4) In this paper Li-Fi had been introduced along with existing techniques and classical trends used for vehicle to vehicle communications purpose. As this project aims to propose a cost effective solution to reduce accidents, the design guidelines and details of system components were thoroughly explored

5) This paper is determined to enhance the quality of Intelligent Transportation System (ITS) with the help of Visible light communication technology using a Li-Fi transmitter and receiver kit. The V2V communication system consisting of the Li-Fi transmitters placed on a leading vehicle and the Li-Fi receiver is placed on a following vehicle.

6) The design system is aim to ensure a highly-reliable communication between a commercial LED-based transaction light and a receiver.

7) The aim of the paper is to design a module for communication between vehicles and to maintain safe distance between vehicles to prevent accidents.

8) In Li-Fi technology for vehicle-to-Vehicle data transmission we use LED bulb. In this technology there is elimination protocols use so in Li-Fi technology complexity get reduce.

9) In this article, we present an implementation of the new digital communication, technology that uses visible light, known as LlFI (Light Fidelity) or VLC(Visual Light Communication), and apply it for inter- vehicle communication.

10) The proposed use of Li-Fi Technology in this paper comprises mainly of Light Emitting Diode(LED) bulbs as a means of connectivity by sending data through optical spectrum as an optical wireless medium for signal propagation.

V. PROBLEM STATEMENT

The major challenge with existing technologies is its low data transmission speed, high power consumption and limited bandwidth. This technology uses LED's for data transmission which ultimately increases the speed of data transmission and reduces the power consumption and use the wide range of bandwidth. Visible light eliminates protocol (electromagnetic), reducing the complexity of system.

VI. SYSTEM ARCHITECTURE

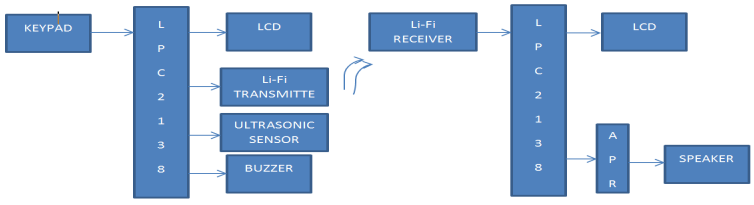


Fig. System Architecture

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The propose plan of action for our project is inter-vehicles communication using optical wireless model having high data rates (in the range of MHz to GHz) and transmission distances is near about 1m. For transmission of information from one device to another device required LED. In this system at transmitter section input data is given using switching control system. According to the data, the microcontroller generates a stream of 1s and 0s thereby translate the data in binary. The output of this controller is given to the LEDs which is connected to transmitter side. Which turn ON and OFF at very high speeds. This ON-OFF regulate the transmits of data through light. LED is the selected for light source since it consumes very less power when compared to fluorescent lamp or a light bulb. In this paper we are presenting the communication between vehicles using light as medium and maintain safe distance between vehicles to avoid accidents. In simple terms, Li-Fi can be thought of as a light-based Wi-Fi. That is, it uses light alternative for radio waves to transmit data. And instead of Wi-Fi system, Li-Fi would use LED lamps that can be used to light a room as well as transmit data. And at receiving end we use photodiode. Since simple light bulbs are used to transmit the data hence provides more security. This system is proposed for communication between vehicles and maintains safe distance between vehicles. The line of sight between vehicles should be clear.

VII. CONCLUSIONS

We are trying to implement a system for communication between two cars using Li-Fi for safe driving and also to avoid accidents.

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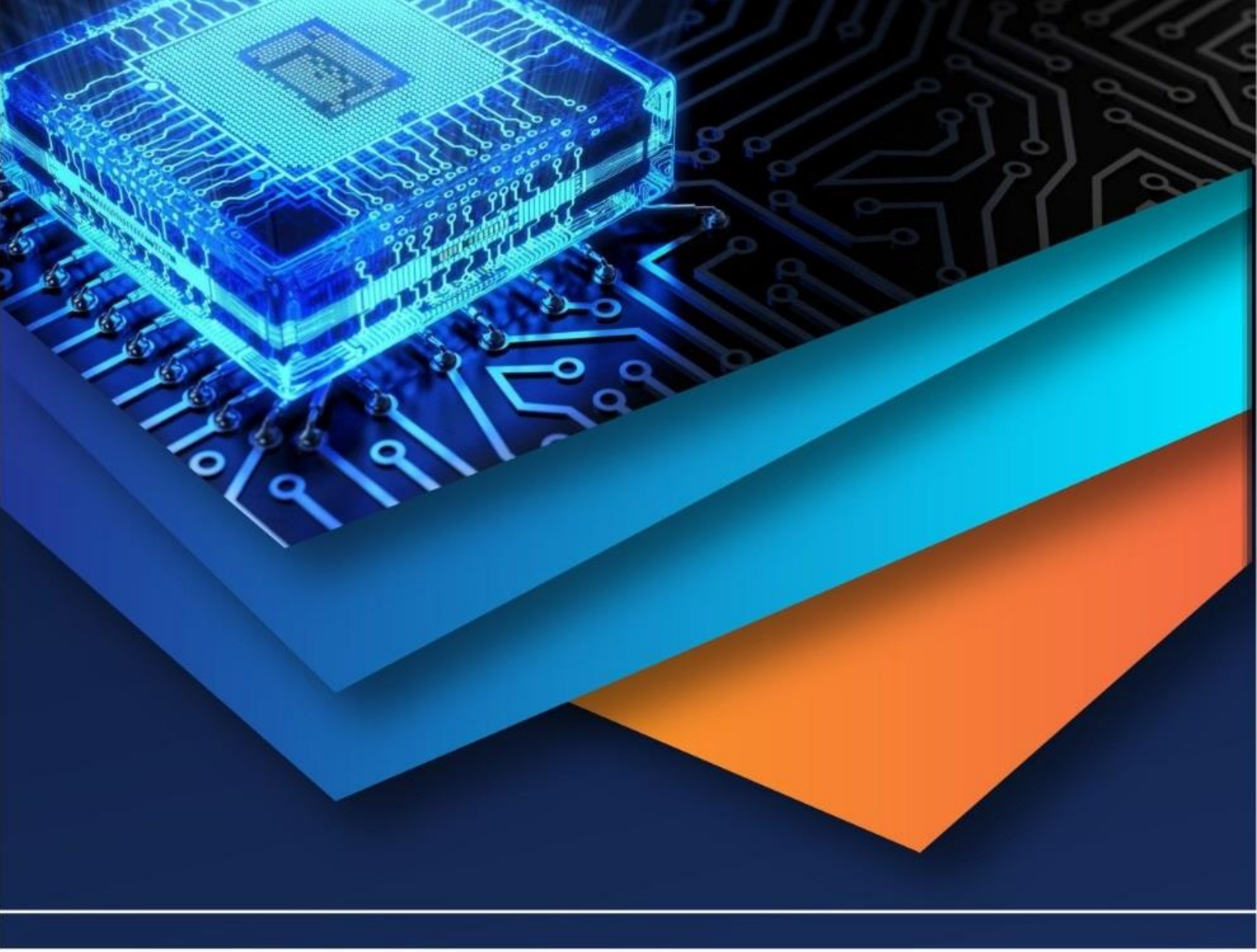
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