Vehicle to Vehicle Communication Using Li-fi Technology

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***Abstract*- This Essay discusses the most recent technology, known as LI-FI, which has seen significant growth over the years. With the use of transmitter and receiver circuits and LED bulbs, two vehicles can communicate using the LI-FI idea. This technology makes it possible to control traffic accidents and save a great number of lives. The two cars only communicate when they come into touch within a certain range, which is desired for the ultrasonic detector, which is a real-life chip device used to assess distance. Data are exchanged from one vehicle to another via tis LI-FI Any type of data can be transferred with LI-FI.**

***Keywords* - Li-Fi (light fidelity), LED, LDR sensor (Light Dependent Resistor), V to V**

I.INTRODUCTION

Almost 5 billion mobile phones are connected to approximately 1.4 million cell, poll radio waves base stations. On a regular basis and regularly. Cell phones send more than 600TB of data. Nowadays, radio waves are used form remote correspondence. Yet there are limitations, accessibility, security and efficiency issues with radio waves. For remote correspondence, range is a crucial need. With advances in technology and an increases in the number of customers, the problem is addressed by the current radio wave range, which leads to came up with the idea of transmitting information remotely through the light using LEDs or LI-FI. LI-FI is a relatively new invention that makes use of LED lights to speed up the transmission of information technology.

Another technique for remote correspondence that makes use of observable light is obvious light correspondence (VLC). Clear light LEDs are frequently used as transmitters for visible light communication, and photodiodes and image sensors are frequently used as recipients. India is highly popular country with significant traffic problems, thus there is always problem with human traffic management if any emergency vehicle appears along a particular, in effective route. The suggested system proposes to use LI-FI for data transmission between two vehicles via led lights, which reduces traffic accidents and encourages safe driving.

II.LITERATURE SURVEY

1.Vehicle Announcement Hoc Networks a New Challenge for Localization- Grounded Systems, A. Backache teal., Computer Dispatches, ScienceDirect, 2008, pp. 1 – 12.

Vehicular announcement Hoc Networks are a brand-new type of ad hoc network that have begun to take off (VAN ets). In these networks, motorcars connect with one another and voluntarily with a roadside structure to give a wide range of operations, ranging from conveyance safety to motorist backing and Internet access. The maturity of protocols, algorithms, and operations in these networks assume that they're apprehensive of the bumps' current positions. This is a enough presumptive supposition given that GPS receivers are simple to install in vehicles, numerous of which formerly have this technology. still, as VAN ets expand into pivotal regions and calculate upon on localization technologies, GPS.

2. N. M. Husain Fidvi, "Car to Car Communication System," available online at http://www.engineersgarage.com/contribution/car-tocarcommunication-system?page=1

Future telematics and infotainment applications in the vehicular arena require a strong wireless network of connected automobiles. Vehicle to vehicle (V2V) communications must deal with extremely dynamic, time-varying channel conditions and shifting vehicle network topology, so we must concentrate on phrases like reliable and continuous system performances. This essay primarily focuses on wireless communication technology used in v2v communication. The technologies we have focused on are Cellular vehicle to everything communication (C-V2X), 4th Generation long term evaluation (4G-LTE), and dedicated short range communication (DSRC). We have also talked about the technical difficulties v2v is having.

3.IsamuTakai, T. H. M. A. Y. K. K. K., "Optical Vehicle-to-Vehicle Communication System Using LED Transmitter and Camera Receiver," IEEE Photonics Journal, Vol. 6, No. 5, October 2014, pp. 7902513- 7902513. "Title of paper if known," K. Elissa, unpublished.

This study offers an optical vehicle-to-vehicle (V2V) communication system based on optical wireless communication technology employing an LED transmitter and a camera receiver, which uses a specialized CMOS image sensor, i.e., an optical communication image sensor (OCI). The OCI contains a "communication pixel (CPX)" that can quickly react to changes in light intensity and an output circuit of a "flag image" in which only high-intensity light sources, such LEDs, have surfaced. The OCI that uses these two technologies offers 10-Mb/s optical capability.

III.EXISTING SYSTEM

Beam alignment between a lens-based receiver with a small field of view (FOV) for high optical gain and a light-emitting diode (LED)-based transmitter is one of the major issues for the vehicular visible light communication (VLC) system. Received Due to the fact that a mobile receiver's optical intensity is subject to large variations, detection and alignment of the beam are delayed. The most effective way to in this case, received optical intensity for high signal-to-noise ratio real-time trajectory tracking of light sources in paper Experiments are conducted using a prediction function based on the Kalman filter.

for dynamic VLC applications, which have been built and proven. The location-based receiver attitude is adjusted using a two-axis gimbal. A wide field of view (FOV) transmitter, which a fast camera. It has been successfully designed and demonstrated for dynamic VLC to use a real-time light source alignment system with a trajectory prediction function based on the Kalman filter. applications. When using a two-axis for changing the mindset, mbal a receiver's ability to align a beam of light, its the alignment deviation was the recommended method was both simulation and experiment have confirmed this. As there are variations practical cameras for the light source in the frame rate the gimbal control delay changes over time as a result of detection. In order to lessen the impact of the variable delay in the identification and alignment of the light source, an adaptive control

A speed planning model based on an S-shape was used to Kalman filter-based trajectory prediction can be used to enhance alignment performance.

IV.PROPOSED SYSTEM

Wherever a smart traffic transportation system is required, the proposed technology can be used. It is made up of two parts: the transmitter and the receiver. Data transmission from vehicle to vehicle using visible LED light. As a result, the suggested system's installation costs and environmental impacts are minimal. Vehicle-to-vehicle communication has proven to be the most effective method for reducing the number of accidents reported on a daily basis.

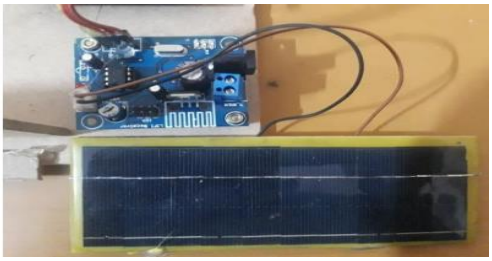
LED light is used in Li-Fi technology for vehicle-to-vehicle data transmission. Because the protocols that are utilized in this technology are being phased out, Li-Fi technology is not overly complex. The goal of this system's design is for it to be extremely dependable, allowing any necessary data flow between the vehicle's transmitter and receiver.

Li-Fi Transmitter

In the Li-Fi transmitter, transmitter receives the information from the controller and it modulates the data to a light signal, and sends to the receiver section. The transmitter section modulates the input signal with the desired time period and broadcasts the data in the form of 1's and 0's using an LED bulb. These 1s and 0s are nothing more than the bulb's flashes. The transmitter section's input specifications are power supply DC +12V, data UART (universal asynchronous receiver transmitter), and input (TTL). With an LED bulb are the 1s and 0s. These 1s and 0s are nothing more than the bulb's flashes.

Before the signal is transferred to the speakers, an amplifier makes a larger replica of the original signal using input from a source, such as a laptop, turntable, or CD player.

Li-Fi RECEIVER

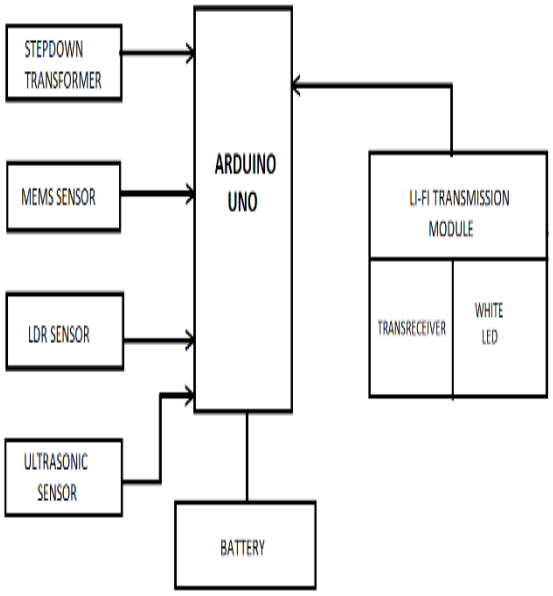


The transmitter component sends the modulated data to the receiver section, which then demodulates the signal to restore the original data. In order to slow down the following vehicle, the receiver section uses a photodiode to detect these flashes. It then amplifies the signal and transmits it to the controller, where it is displayed on the LCD display. Bluetooth receiver takes the

information that has been modulated from the transmitter portion and demodulates the signal to recover the original data. Using a photodiode, the receiver part captures these flashes amplifies the signal and outputs the result.

V.BLOCK DIAGRAM

TRANSMITTER PART



RECEIVER PART

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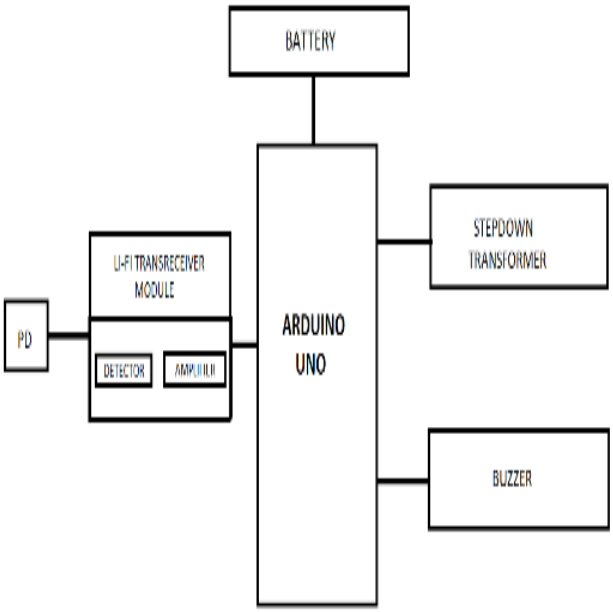


VI.OUTPUT

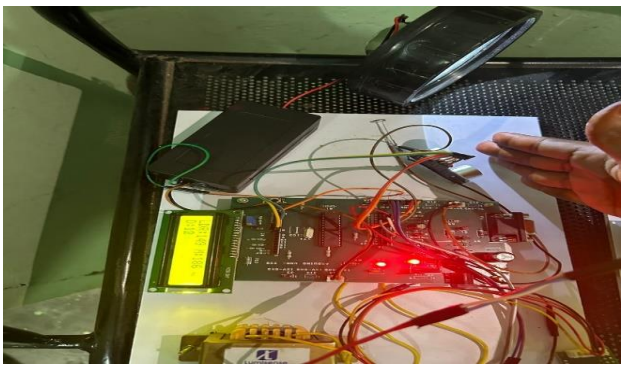


Fig. TRANSMITTER PART

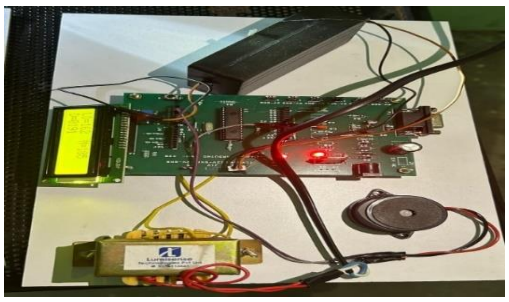
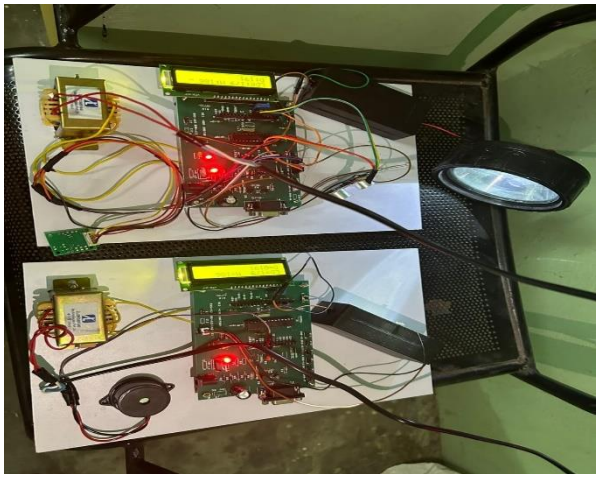


Fig. RECEIVER PART



Consequently, the hardware is put together as illustrated in figure 6, with the microcontroller receiving a 12volt power supply and the sensors portion receiving a 5volt power supply. It transmits the desired data from one vehicle to another vehicle.

VII. TEST AND EVALUATION

The circuit described above was installed in two vehicles and utilised on the OMR Road in Chennai. It was discovered that the data was communicated very effectively and that Li-Fi technology can be used to some extent to manage and minimise car accidents.

VIII.CONCLUSION

Our system's goal is to use light to connect automobiles to one another. Here, the Arduino transmitter is used to produce the light. The transmitter's light from the second vehicle is captured by the receiver. The recipient's output of light intensity determines the length of the vehicle. Measure the separation between side obstructions and the vehicle using the ultrasonic sensors. This kind of vehicle is very affordable and simple to maintain. The vehicle distance is precise, and the success rate is also high. We use light as a transmitting medium so it is non-radiative and environmentally benign. Despite the fact that this system uses Li-Fi technology and anticipates the front-end vehicle.

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