



Contemporary Review on Li-Fi Based Accident Prevention System

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Abstract -- Street mishaps are human hardship. They include significant human and monetary enduring as there is no prompt assistance given to the harmed individuals. A many individuals witness the mishaps however neglect to offer assistance as they are reluctant of police examination and charges, and consequently casualties kick the bucket because of absence of clinical assistance. By and by there are different exude advancements like Adaptive voyage control, Anti Breaking System (ABS), Airbag framework which are accessible just in top of the line vehicles that forestalls mishaps yet they don't give any cures in case mishaps happen. To beat the limits of it, within this paper we offer such a system that will help in prevention of road accident using Li-Fi technology, further develops street well-being, security, correspondence medium, execution observing and builds efficiency.

Keywords--- Li-Fi, V2V communication, Anti-Breaking System.

I. INTRODUCTION

Increased Population has prompted quick expansion in use of vehicles which thus is answerable for increase in death rate. WHO dispatched a Global Status Report on road safety which features that the yearly road traffic loss of life has arrived at 1.35 million every year with most noteworthy road casualty rates in developing nations. Across 199 nations, India positions first I in the quantity of street mishap passings followed by China and US, the most compelling motivation being over speeding, tipsy driving, carelessness of the driver. The World Health Statistics 2008 [1] expressed that in International Report on Road Safety expresses that Road Traffic Injuries were the ninth driving reason for death and at current rates by 2030 are relied upon to be the fifth driving reason for death. Furthermore, the Law Commission of India portrays a genuine street mishap happening in our nation causes a passing of 17 Indians every hour out and about.

II. LI-FI TECHNOLOGY

Li-Fi stands for Light Fidelity and it is a Visible Light Communications (VLC) framework which functions remote correspondences movement at extremely high rates. In technical language, Li-Fi is a light correspondence system that is fit for sending info. at

high velocities over the apparent light and infrared ranges. For the time being, only LED lights can be used for visible light transmission.

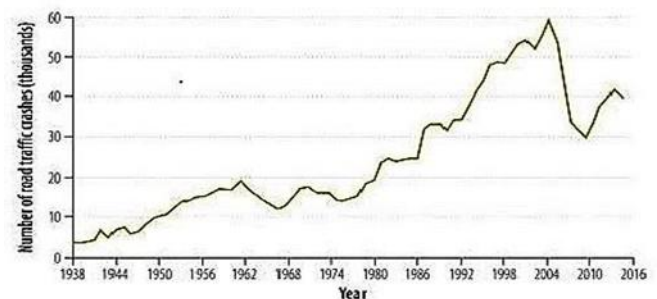


Fig.1 WHO Status Graph

Li-Fi is a subset of the optical remote correspondences (OWC) innovation, which use light from light-emitting diodes (LEDs) as a means for transmitting network, versatile, and speedy data via these lines to Wi-Fi.

Visible light communications (VLC) functions by transforming the current to the LEDs now and again at an exceptional high velocity, too fast to be seen by the naked eye, hence, it doesn't present any glinting. LEDs should be kept on to pass information, otherwise they might not be visible to human eye while as yet radiating sufficient light to pass information. When considering the perceived range, this is also a substantial innovation bottleneck, since it is restricted to the objective of enlightenment and has not been radically altered in accordance with a mobile communication purpose.

Li-Fi enjoys the advantage of being useful in electromagnetic sensitive regions, for eg., in airplane platforms, emergency clinics and thermal energy stations without causing E.M impedance. Both Wi-Fi and Li-Fi communicate information over the electromagnetic range, yet though Wi-Fi uses radio waves, Li-Fi uses apparent light, Ultraviolet and IR.



Fig.2 Wireless Communication

III. LITERATURE REVIEW

Li-Fi and Wi-Fi both are similar in many ways as both communicate information electromagnetically as Wi-Fi offers radio waves, while Li-Fi changes noticeable L waves. Visible light communication (VLC) obliges a photograph locator to get light signals and uses a sign handling components to change over the information into stream-capable substance. The proposed model uses a leaf engineering with two modules, in which one go about as leaf transmitter and the other as leaf beneficiary. The ultrasonic sensor distinguishes the vehicles which are not as much as limit distance and sends an alarm message by showing brake in the LCD show. The transfer will apply the brake on the second vehicle consequently when the information is received.

Arthi R et al. in [2] have been discussions about the broad progressing research action identifying with submerged interchanges and submerged sensor organizations. On one hand, the primary research lines depend on expanding the distance and data transmission, and, on the other hand, the endeavour to lessen the energy utilization of submerged gadgets, with the point of expanding the organization lifetime. The proposed system submerged correspondence framework utilizing Li Fi innovation which gives assurance against transport impacts on the ocean. This undertaking centres around the security on In an ocean, headlights with LEDs acting as transmitters communicate with photo sensors acting as receivers. White LEDs utilized in the head and tail lights can viably be utilized for short range correspondence with the photograph indicators. The application is practical as LEDs are modest and straightforward calculations are proposed for signal age and transmission.

A.A jamali et al. in [3] Introduced the practical technique to keep away from impact between two vehicles (for example front and back vehicles) by utilizing LiFi innovation. The idea of rise of LiFi innovation alongside the procedure of V2V correspondence has been presented productively. The undertaking presents a basic module of vehicle to vehicle correspondence through apparent light correspondence that can be executed in ongoing vehicles. Utilizing straightforward LED lights as transmitter, photograph diode as a collector and basic hardware makes it financially savvy. At transmitter speed sensor is utilized

to handle the speed and brake condition at that moment of the vehicles to send over back light/brake light of the vehicle. At the collector side photograph diode distinguishes this and the signal is frightened to show brake. This system is economical .

Mahima Gupta et al. in [4] There have been discussions about several cases such as: First in which Communication between car and RSU and second in which Inter vehicular communication 3) Communication based network system. The arrive at capacity, delay in transmission and rate impacts are assessed concerning the normal distance between vehicles utilizing pixel situated representation. With the assistance of LEDs fitted in the vehicle, we can send information consistently utilizing fast beat of light over VANET (Vehicular Ad-hoc network) for rapid interchanges. They examined about Li-Fi innovation and its application in vehicle to vehicle correspondence. The sorts of various vehicular correspondence are introduced. These correspondence frameworks can have shifted applications like mishaps control , traffic and clog control and shielding drivers from vulnerable sides. The framework plan for foundation based vehicular correspondence framework is proposed and network administrations needed for this framework are set up.

R. Anitha et al. in[5] It was proposed to work on the greatness of Intelligent Transportation System (ITS) with the assistance of Optical communication technology utilizing a LED in the transmitter side and a camera receiver side, which utilizes a further developed CMOS picture sensor which is an optical correspondence picture sensor (OCI). The vehicle to vehicle correspondence conspire comprises of the LED transmitter situated on a moving front vehicle and the camera as recipient is set on a next followed vehicle. The received data can be utilized for more ensuing improvement in vehicle control and to keep from mishap impacts. To get the 10 Mbps class information rate and the continuous LED openness The two things are vital during advancement of the OCI.

Ultrasonic sensors have also been utilized to gauge the distance between two vehicles. In this proposition the programmed brake is applied when the driver is similar .If a lush is driving the vehicle, it's distinguished utilizing liquor sensor and furthermore information are communicated to beneficiary vehicle, ringer rungs and showed about the current situation as customized. Vehicle to vehicle correspondence has a brilliant future and go about as a supplement to the current RF correspondence by accomplishing higher productivity. In this quick world this innovation suits the most. The transmission of information has been made more straightforward and quicker by utilizing Li-Fi .The Future extent of this venture is the expansion to vehicle to foundation correspondence to clear a way for smart city.

A system implemented with the Li-Fi technology (Light Fidelity) in which each vehicle is linked. This Li-Fi system is used for the transmission and receipt of vehicle

information. The entire system is to be made up of the transmitter and receiver part for the transfer of data using Li-Fi, through interfacing connections and different sensors. In this paper, the author reviewed Intelligent voice communication and device switching. Li-Fi clarified that the communication medium as a light is like other remote communications, rather than radio transmissions, apparent light can be utilized for information move between the framework. Two fundamental ideas were managed. In the first place, when slowing down is applied, the message is shipped off to vehicle. Another methodology is that vehicles are at the intersection T, vehicle 1 constantly sends its speed cautioning through the fog light LEDs to vehicle 2. This speed is contrasted with the photodiode got in vehicle 2 and assuming that another vehicle is available, the driver will know about the circumstance.

A vehicle-with vehicle (V2V) correspondence system upheld actinic beam correspondence innovation. A vehicle can transfer content to content ceaselessly to a diverse vehicle in front of its exploitation main lightweight,

Furthermore the Info. is kept on inside the secure Digital card in coma separated cost for reference. Now-a-days people utilizes net in their day to day exercise to achieve their errand by proposes that of remote or wired org. As clients square measures increasing complex, data transmission rate decreases. Nonetheless, wi-fi confers pace of 150 MBPS, this speed keeps on being same not to serve the requirements of a client. Keeping this in mind, actinic beam correspondence thought has been proposed. While this venture was going on, a near and logical review W.R.T the speed of actinic beam and wi-fi correspondence is being done and also decrease of organization ECM disadvantage in light of broadening clients request is furthermore being finished.

This system proposes, a period of-flight based indoor situating system for LiFi is introduced dependent on the ITU - T proposal G.9991. Exact position data is considered as the principle empowering influence for the execution of shrewd assembling frameworks in Industry 4.0. The positioning system depends on schedule of-flight estimations between numerous optical front-closes conveyed at the roof and a cell phone moving inside the covering inclusion region. The recently intended for the correspondence capacity of Li-Fi being accessible when following the ITU-T suggestion G.9991. We have exhibited that the high level situating calculation can arrive at accuracy under 1 cm with sensible optical frontends when utilizing a 3D situating calculation to decide the recipient facilitates. In people in the future of G.9991 chipsets, the portrayed situating procedure can be acknowledged utilizing surely knew correspondence innovations with reasonable exertion.

A propose chance of broadening the UNI connection LOS channel reactions into a dispersed MU-MIMO design. Hence, they have focused on the most optimal way to further enhance the development of unwavering quality

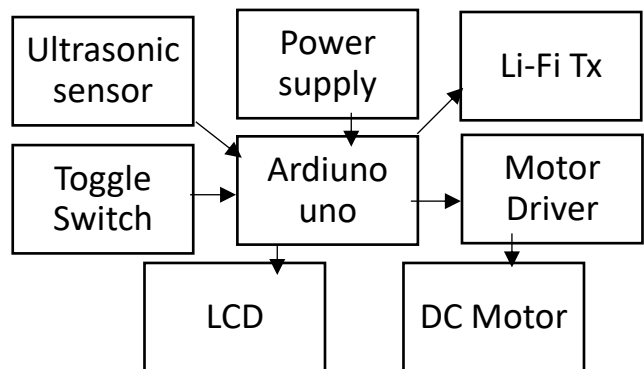
through spatial differences when the LOS is Implemented and increased information rates through spatial multiplexing. To complete profit from the equal in Info. transmission. As a important detract from this review, first they use to select the suitable transmitters for each beni=eficiary and then consolidate them for combined transmission. This will provide the required spatial dffrence and upgrade unwavering quality against expected blockage.

They empowers a likely advancement of the 2-directional client throughput by lessening the measure of input. In this paper, 2 methods for diminishing the measure of input in Li-Fi cell networks are proposed: 1) restricted substance criticism conspire dependent on lessening the substance of criticism data and 2) restricted recurrence criticism plot dependent on the update span. The previous depends on diminishing the substance of criticism data by just sending the SINR of the first sub-carrier and assessing the SINR of other sub-carriers at the AP. The ideal update span was inferred, which brings about a greatest expected total throughput of uplink and downlink. It additionally showed the introduced LCF and LFF plans give better aggregate throughput while communicating lower measure of input contrasted with the pragmatic the slightest bit criticism technique. The mix of the LCF with the updated stretch is the subject of our future implementations’.

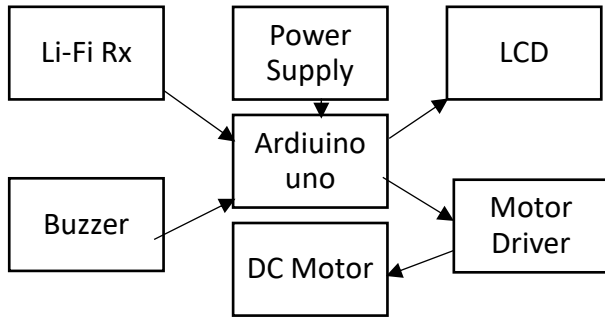
IV. PROPOSED METHOD

In this project we took Arduino UNO microcontroller which will function as the nervous system and therefore the whole code of the framework will be collected in it .

We took two conditions (i) Transmitter Unit



(ii) Receiver Unit



Both of the units will act as Transceiver based on the concept of the project . Both of the units comprises of LCD which tells us the condition of each and the obtained sensor data. DC motor is set at each unit to show the vehicles speed. If one unit motor slow down means the motor at other end automatically

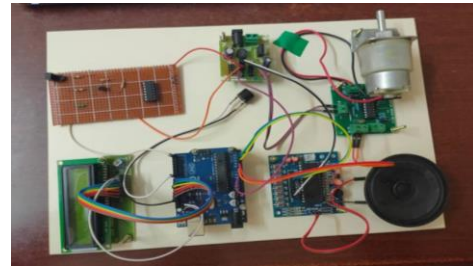
slows as because data communicates via Visual Light. In the receiver side we will use a Photo Detector Circuit , which consists of a photo transistors . The basic function

Fig. V 2 V Hardware

V. SURVEY COMPARISON

Title of the paper	Author and year of publication	Outcome	Drawbacks
Avoiding accidents using Li-fi in Automobiles	R.Anitha, S et al. 2017	CMOS image sensor is used that is an optical communication image sensor(OCI).	Model can only be proposed in Raspberry Pi.
Intervehicular communication for accident avoidance using Li-Fi technology	R Akshaya, et al. 2019	To calculate distance between two vehicles using Ultrasonic sensor.	Distance between the two sensors can result in poor outcome.
Instructure-less vehicular communication using	Mahima Gupta et al.	RSU and car communication. Intervehicular	Light prevention can affect the proper connectivity

of the photo transistor will be to convert the light energy into voltage and current . Toggle switch is at one section for right left indication which warns the other section . Due to reason of the previous proposed model drawback in which the driver of the vehicle driving from a blind sight was not aware about the other vehicle coming or due to any carelessness of the driver , this model introduced the concept of V 2 V (vehicle to vehicle) communication a wireless medium of communicating through which the system could be advance enough to talk with other systems and predict the situation better in advance and to avoid any kind of casualty. It even resulted in a faster response with comparing it to the previous system .



Li-Fi technology.	2016	ar communication network system based on communication	y between devices.
Distributed Multiuser MIMO for Li-Fi	Sreelaal Manvanchery et al. September 15,2021	Maximizing the use Li-Fi in indoor medical clinic. Improving the dependability using proper MU-MIMO plans.	
Feedback Reduction in Li-Fi Network for Bidirectional User Throughput Maximization.	Mohammad Dehghani Soltani,, et al. July2018	Proposed LCF and LFF conveys lower proportion of info stood out from the even minded a tiny smidgen	Internet access for the wireless communication can be interfered if there is no proper connectivity.

		analysis method.	
Underwater Communication using Li-Fi.	Arthi R, et al. IJRP , 2018	This centers around security of ocean in which headlights goes as transmitter and photo sensors goes as collectors.	Changing weather condition can r

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VI. CONCLUSION

In this paper we tried to provide a brief idea about the technical enhancement of the usage of Li-Fi technology in prevention of road accidents with vehicle to vehicle communication systems and learnt about the uses of Li-Fi as a bi-directional wireless communication method in comparison to Wi-Fi . We learnt that Li-Fi has a good density coverage over a region and can be used not just on proper grounds but in oceans for the advancement of security , we came across many different ideas as proposed by different authors in the technical advancement for the greater good either its communication based or accident prevention with the cost effective methods, we also realised that the Li-Fi technology will advance and overcome other communication methods in the future .

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