

An Enhanced Vehicle Communication Using LI-Fi and IOT Technology

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Abstract:

Utilizing the idea of Li-Fi two vehicles are spoken with the help of transmitter and receiver circuit. Li-Fi (Light Fidelity) with the help of this innovation the road mishap can be controlled and numerous human life can be spared. ultrasonic sensor which is utilized to quantify the separation is apply here just to impart the two machine(vehicle) when they are in the contact in some range which is preferred for the ultrasonic sensor. Exploiting this Li-Fi the data are transmitted starting with one vehicle then to the next. The information that is transmitted through Li-Fi can be any information like sound, video or content. A message is sent by means of Li-Fi at whatever point the main vehicle is eased back down or that vehicle need any crisis. At present, the everyday exercises use parcel, which can likewise be utilized for correspondence due to the favorable circumstances like quick exchanging, high force productivity and safe to human vision. Thus, this task displays about eco-accommodating information correspondence between vehicle to vehicle utilizing Li-Fi.

Keywords: Li-Fi, Vehicle communication, IoT, Sensors

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Introduction:

This project to avoid accidents in our surrounding to save many humans life and the system is designed considering the normal car user can also use it. Speed and security is the major concern while transmitting data. Wi-Fi can be easily hacked as it penetrates through the walls. On the other hand Li-Fi requires a Line Of Sight (LOS), it does not penetrates through the walls and so provides more security. The key technical difference is that Wi-Fi uses radio frequency to transmit data but Li-Fi uses visible light. The main component of

Li-Fi communication is the high speed which provides a data rate of greater than 100Mbps.Human life is to be consider while transmitting the data from the one vehicle to another vehicle. When transmitting the data from one car to another car the driver can be disturbed by the vibrations. To avoid these accidents messages will send to the other or opposite and nearby vehicle will receive the message immediately, so that they can be alert of the accident. Li-Fi (Light Fidelity) it's a wireless communication technology. Accidents are avoided by our project concept.The data are transmitted by the transmitter and receiver, the transmitter used

to transmit the data and the receiver used to receive the signal send by the opposite vehicle. We use the Li-Fi to transmit the information easily but the Wi-Fi can transmit the data but it can easily through walls it penetrate by hacked a vehicle infotainment stage has devices numerous data gathering, and touchy data can be gotten to by a foe. To trade some delicate vehicle information, we need to have a steady connection, The correspondence between the vehicle and the cell phone has no a lot of touchy information, thus to keep information security and to forestall assailant to get to this data is significant. a vehicle infotainment stage has numerous apparatuses for gathering data, and touchy data can be gotten to by an enemy. guaranteeing that this data remains inside the vehicle and the pertinent cell phone and is available just to believed parties is a basic issue toward accomplishing security. an android cell phone application the cell phone required to extricate akin data from the articulation of a vehicle like speed esteem.

Literature Review:

Trial correlation of heartbeat abounding and spatial regulations for vehicle-to-vehicle noticeable light correspondence in unit configurations. Visible light correspondence (VLC) is an appealing reciprocal correspondence innovation for vehicular applications, for example, platooning. In spite of the fact that information rates around 100 kbps are sufficient for urgent information transmission, it might be valuable to arrive at a couple of megabits for every second for different applications like systems administration. Such information rates can be come to by utilizing fitting balances and clock rates. Right now, types of heartbeat sufficiency balances (PAM) are looked at in a vehicular setting: on-off keying (OOK),

PAM-4 and summed up space-move keying (GSSK). These tests show that OOK and GSSK are the most intriguing tweaks for expressway platooning applications. OOK gives surely a decent versatility while staying easy to execute. The significant advantages of driving vehicles in controlled close developments, for example, detachments are that of expanding traffic smoothness and decreasing air contamination. While Vehicle-to-Vehicle (V2V) correspondences is essential for platooning dependability, the current radio interchanges innovations (e.g., the IEEE 802.11p) experience the ill effects of terrible showing in exceptionally thick street situations, which are actually to be made by platooning. This paper examines the pertinence of obvious light interchanges (VLC) framework for data trade between the unit individuals. At last, a SIMULINK model is created to consider the exhibitions of a platooning longitudinal and parallel control, where VLC is utilized for V2V data trade.

Working of Li-Fi:

It merits taking a gander at the different driver help framework effectively accessible in various vehicles. With new innovation advancement a great deal of help is currently accessible on the vehicles in huge arrangement. The sonar sensor is used to measure the distance and the sonar is nothing but ultrasonic sensor, this sensor is used in our project to measure the distance to communicate with the opposite vehicle to avoid the accident .while conveying this message the distance are shown in their vehicle to control their speed of the opposite vehicle and the nearby vehicle.The driver can be alert by their message given by the other vehicle. At the point, the cell phone needs to interface with the delicate data of a vehicle the cell phone utilize the Advanced

Driver-Assistance System. The radio waves innovation experiences different clamor and impedance. Along these lines to guarantee this delicate information correspondence, the Visible Light Communication innovation is a decent reciprocal competitor and isn't touchy radio correspondence. To attain a vehicle-to-vehicle correspondence platooning framework is utilized. Various tests learn about the indoor noticeable light correspondence framework using white Light Emitting device (LED). Lights have been transmitted and high information rates have been manifested. Be that as it may, these works focus just on Vehicle to Vehicle or indoor correspondence individually. Our worldview is a blend of Vehicle to Vehicle and indoor condition. Communication framework interior a vehicle is an indoor condition, yet the vehicle move continuously as like as Vehicle to Vehicle condition. Subsequently, the neutral of this work is to initiate and to consider an Visible Light Communication model ready to meet the pre-requisites of ADAS (Advanced Driver-Assistance Systems) applications for the vehicle referenced previously. The scheme of this Visible Light Communication model will be exhibited in next Section.



Architecture of Global Design:

1. Prototype: PSP (Play Station Portable) vehicle cockpit is utilized as a model in the research center to copy real vehicle for test. Different apparatuses inside this model give

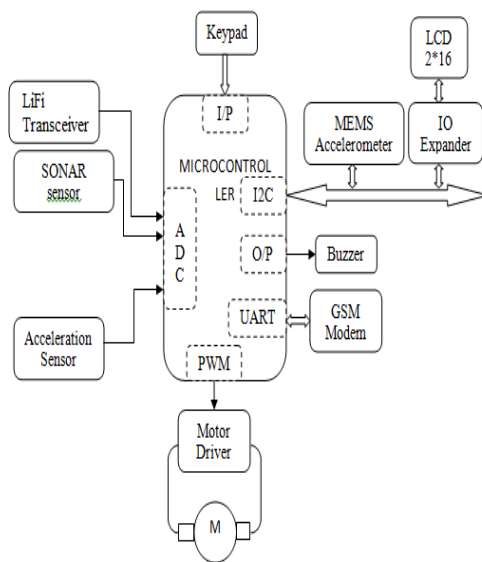
intriguing driving setting data. We can also follow, the vehicle speed called as vehicle data, is given by OVIP (voice communication over Internet Protocol) stage is created to Play Station Portable (PSP) vehicles.

2. Android phone: Utilized as Human-machine communication devices and to access from internet and associated with the objects. Simultaneously, we use likewise cell phone camera to screen the driving street and framework. At that point the Advanced Driver-Assistance System applications are introduced on all phones for the automobilist help.

3. Li-Fi: Bluetooth, 4G and visible light communication (VLC). In our Advanced Driver-Assistance System framework, thus join diverse remote correspondence to do accomplish various objectives. The Bluetooth give the control utilizing the vehicle's speaker. 4G association gives us the network data and helps us for driving; likewise the traffic data along with climate condition are so forth. Here we use the VLC (visible light communication) to trade the touchy data in between the vehicle and then the vital cell phone. Hence at the last piece of the section, the structure of visible light communication framework is point by point.

4. Acceleration Sensor: It is device used to detect the location of mobile device. Used to vibration and health monitoring machinery and find the liability in rotator machine. Digital devices and analog devices are available in accelerometers. The gadget must be planned so that it has higher affectability that is in any event, for a little speeding up power the electrical yield sign ought to be very high. Thus a high sign can be estimated effectively and makes certain to be exact.

5. Sonar Sensor: Sonar sensor is nothing but ultrasonic sensor. It is used for the distance between one vehicles. It is known as the acoustic sensor. They are divided into three types. They are transmitters, receivers and transceivers.



The weight sensor changes over the mechanical weight an incentive into a corresponding electrical signal. It is the principle and working of transmitted. The recipient utilizes electronic channels to isolate the ideal recurrence signal from the all other sign picked by an antenna, an electronic intensifier to build the intensity of the sign for additional handling lastly recuperates the ideal data through demodulation.

6. MEMS Accelerometer: It is used to calculate the vibration, it will measure the electromechanical device like gravity motion. One of the most ordinarily utilized MEMS accelerometer is the capacitive sort. The capacitive MEMS accelerometer is well known for its high affectability and its precision at high temperatures. The gadget doesn't change esteem relying upon the base materials utilized and relies just upon the capacitive worth that happens because of

the adjustment in separation between the plate

7. Buzzer: The buzzer is used as a signaling device. The buzzer is typically electronic and is usually used in household appliances like microwave ovens. A ringer or beeper is a sound flagging device, which might be mechanical, electromechanical, or piezoelectric (piezo for short). Regular employments of signals and beepers incorporate caution gadgets, clocks, and affirmation of client info, for example, a mouse snap or keystroke.

Existing Method:

VLC (Visible Light communication) is used for the transmission of available data. LED is used for a light-discharging diode (LED) is a semiconductor light source that produces light when current moves through it. Electrons in the semiconductor recombine with electron openings, discharging vitality as photons. The shade of the light (comparing to the vitality of the photons) is dictated by the vitality required for electrons to cross the band hole of the semiconductor. White light is gotten by utilizing different semiconductors or a layer of light-radiating phosphor on the semiconductor device. ADAS (Advanced Driver Assistance System) applied in an android phone application; the related data is needed to be separated by the cell phones from the interface of a vehicle. The data of vehicles are like speed value, vehicle headlamp control and landmark. Here, manifested our Visible Light Communication framework for a steady empowering, private correspondence and secure between a vehicle model and a cell phone. This methodology depends on the implementation of a noticeable light discharging device for downlink and an

uplink uses IR lights. VLC framework has been combined into an Advanced Driver-Assistance System function for our ADAS frame. At long last, our trial study has demonstrated that our VLC model is practical for giving an adequate nature of the information connect and can run on asset obliged stages. In any case, our VLC frame is worked in an indoor condition that is inside the vehicle. Thus in dull room the indoor test are worked, as yet perfect and not completely consider the effect of threshold encompassing light in genuine driving condition. Consequently, the analyses utilizing a genuine vehicle are preferred to examine climate setting effects. The effects of climate as downpour with the daylight and light from an automobile. The light obstructions from a VLC framework are displayed.

Proposed Method:

Using the Li-Fi and platoon in the vehicles from one vehicle to another vehicle the message or information passed to the vehicle or nearby vehicles. Using the acceleration sensor the accident occurred in vehicle means it store detailed about the how much speed the vehicle came and accident occur, it tell about the accident vehicle and accident made by the other vehicle. It shows the time duration and distance between the vehicles. If vehicle to vehicle data transmission through Li-Fi. Using the transmitter and receiver the signals are transmitted and received by the vehicle, vehicle to vehicle communication is the most effective solution. By the data transmitter and receive the accident are avoided and the human life are saved. LED (Light Emitting Diode) used to transmitted the light signal. Two vehicles are communicated by the transmitter and the

received, to avoid the road accident and to save the human life. In both the vehicle the sensor will be place to calculate the speed and give the information to the opposite vehicle to avoid the accident. To send the alert information to the environment or to the word around the vehicle the button is used, by pressing the button the vibrations are send to the other vehicle all the data can be stored or recorded by the acceleration sensor. The speed is controlled by vehicle which moves first and the second vehicle speed is controlled by the first vehicle.

Conclusion:

One vehicle speed is controlled by other vehicle which moved first, if the vehicle going to meet an accident it controls the speed of the vehicle coming nearer to the vehicle to mat the accident. And the data are saved in the data saver by using the acceleration sensor. MEMS acceleration is used to calculate the vibration and ultrasonic sensor is used to measure the distance of the two vehicles. The motor speed will be controlled by the other motor. GSM modem is to communicate with the mobile; the audio is transmitted to the mobile by using the GSM at 1900MHz frequency bands. And the GSM is to data transmitted, the data like audio, video or SMS. ADC(Analog to Digital Converter) the data sound received will converted by analog to the digital signal. The vehicle speed will be controlled.

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