VISIBLE LIGHT COMMUNICATION: A INNOVATE SYSTEM FOR AUTOMOBILE EMERGENCY SAFETY AND SECURITY ALERT

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Abstract- *A new technology for next generation vehicle communication, Visible Light Communication (VLC) is the one of the advanced technology where we can communicate in the better way. Towards the future the vehicle are connected anywhere and anytime by optical signal and light signal.*

Here the communication is done through the light signal. The major instructions like braking, steering control and security system are communicated; therefore the risk and danger can be avoided. In this case, pre information will be transmitted to avoid the risk and dangers ex. speed breaker on road, sudden cracks on the road here, the communication is done between the cars Via VLC. In that car the Microcontroller unit will be connected which will perform the functions and We can create the android app (Text to Speech) from that the voice alert will be given to the vehicle owner. Bluetooth device is used to transmit the emergency data to android mobile. Additionally, Buzzer is used to alert the user and next cars. the information will transferred and it will be displayed on the LCD screen.

Keywords-Intelligent Transport System, Light Emitting Diode, Visible light communication, Photodiode, Vehicle-to-Vehiclecommunication.

1.INTRODUCTION

Unfortunately, most counties in the world has an alarming record in number of death/disability due to tremendous number of accident. Accidents are occurred because of unawareness of the people. Researchers [1] found that 57% of accidents where due to solely driver factors, which include hisbehavior, decision making ability, reaction speed and alertness.

In simple terms, LI-FI can be thought of as a WI-FI based on light as it uses light instead of radio waves to transmit information. Instead of WI-FI modems or routers, LI-FI uses transceiver-fitted LED lamps that can be used as a light or for transmission of the data communication through internet. This technology uses a visible light communication spectrum and has not major ill effect as we know that the light is very much part of our life. Moreover in this spectrum 10,000 times more space is available and it also multiplies to 10,000 times more availability as a light bulb and street bulbs are available already . The environment with the LI-FI technology where light bulbs are used as a data communication medium to PC, Laptop, Tablet and PDA as it all have photo detector connected to it as receiver.

LI-FI is implemented using white LED light bulbs which used for illumination by applying a constant current. However, by fast variations of the current, the light output can be made to vary at extremely high speeds. If the LED is on, it transmits a digital 1otherwise it transmits a digital 0. The LEDs can be switched on and off quickly to transmit the data that can't be detected by a human eye . There are also some enhancement could be made, like using an array of LEDs for parallel transmission, or using amalgamation of basic three color's i.e., red, green and blue LEDs as different frequency with each having a different data channel. To further get a grasp of LI-FI consider an IR remote. It sends a single data stream with 10-20 kbps speed. Now if we replace the IR LED with a large LED array then that can be capable of sending thousands of such streams at a very fast rate.

2. LI-FI

- Li-Fi is a new technology for short range wireless communication system; which is suitable for data transmission via LEDs by illumination.
- It uses the visible light, a part of the electromagnetic spectrum that is still not greatly utilized, instead of RF part.

3. VISIBLE LIGHT COMMUNICATION

Visible light communication (VLC) is a data communications variant which uses visible light between 400 and 800 THz (780–375 nm). VLC is a subset of optical wireless communications technologies. The technology uses fluorescent lamps (ordinary lamps, not special communications devices) to transmit signals at 10 Kbit/s, or LEDs for up to 500 Mbit/s. Low rate[vague] data transmissions at 1 and 2 kilometers (0.6 and 1.2 mi) were demonstrated. RONJA achieves full Ethernet speed (10 Mbit/s) over the same distance thanks to larger optics and more powerful LEDs. Specially designed electronic devices generally containing a photodiode receive signals from light sources, although in some cases a cell phone camera or a digital camera will be sufficient[6]. The image sensor used in these devices is in fact an array of photodiodes (pixels) and in some applications its use may be preferred over a single

photodiode. Such a sensor may provide either multi-channel communication (down to 1 pixel = 1 channel) or a spatial awareness of multiple light sources.

4. EXISTING SYSTEM

- The communication is done between the cars manually or through message.
- The message will be transmitted and received via GSM.
- The person should type the text while driving and he should send the message to another car.
- There is less chance to see the message so complete communication is not happening in these system.

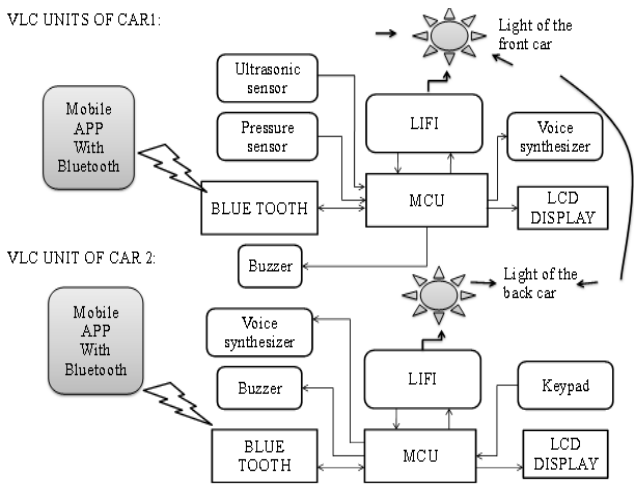
5. DISADVANTAGES

- GSM technology is not adoptable.
- The risk will be high.
- Communicating via GSM there is chance to miss the alert.
- While travelling the signal of the cell may varies.

6. PROPOSED SYSTEM

- We are communicating through Light intensity.
- The data is transmitted to one end from another end Via VLC.
- The Microcontroller Unit is placed on the cars.
- LIFI will transmit the information from one end to another end.
- Bluetooth device is also used to operate the internal system of the cars.
- The blue tooth pairing with our mobiles we can control the particular system.
- The information is transmitted as the voice signal.
- The voice as the input and the receiver will receive the voice .
- Buzzer is connected to alert the users.

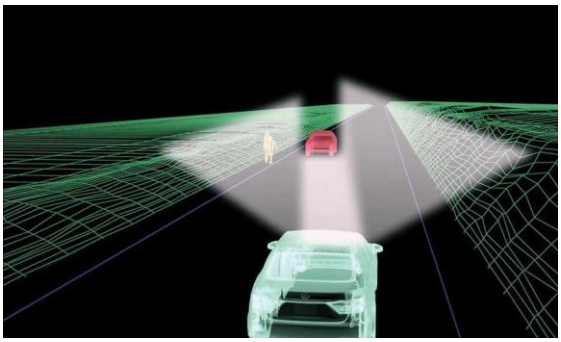
7. BLOCK DIAGRAM



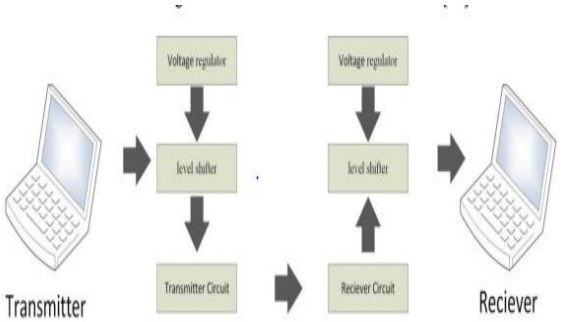
8. ADVANTAGES

- Here, we are communicating Via light, It is advanced and easy way..
- The alert is passed as a voice signal, instantly we can hear the alerts.
- We can control the system by blue tooth.

9. SIMULATION

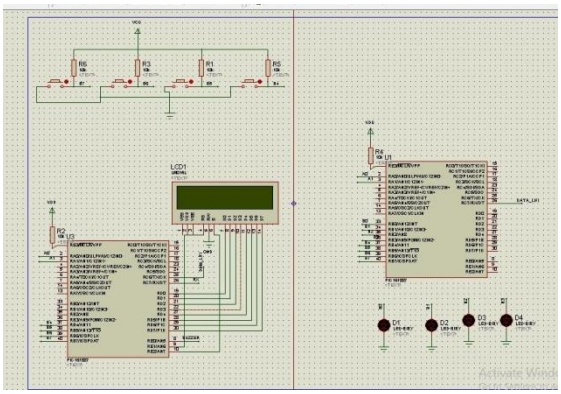


10. WORKING PRINCIPLE



11. CAPACITY

- **Bandwidth:** The visible light spectrum more abundant 10,000 times compared with the RF spectrum..
- **Data density:** Li-Fi can achieve about 1000 times the data density of Wi-Fi because visible light can be well contained in a tight illumination area, whereas RF tends to spread out and cause interference.
- **High speed:** Very high data rates can be achieved as high as 500mbps or 30GB per minute due to the low interference, high device bandwidths and high intensity optical output.



12. CONCLUSION

Smart industrial automation system enhanced with visible light communication gives efficient result without any hazard to nature. It is also efficient in cost and resources. All the facilities at industry can easily be controlled using light and visible light has negligible harm to humans as well as to nature. Since the VLC system uses LEDs as a transmitting device, while photo detectors as receivers it is efficient and cost effective. We are communicating through Light intensity. The data is transmitted to one end from another end Via VLC. The Microcontroller Unit is placed on the cars .LIFI will transmit the information from one end to another end. Bluetooth device is also used to operate the internal system of the cars. The blue tooth pairing with our mobiles we can control the particular system. The information is transmitted as the voice signal. The voice as the input and the receiver will receive the voice . Buzzer is connected to alert the users.

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