

# Light-Fidelity(Li-Fi) and its Application

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## Li-Fi stands for

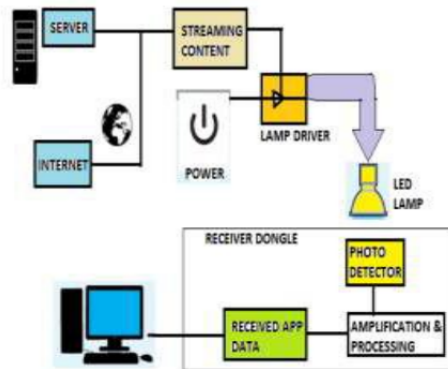
- Light Fidelity
- Light based WI-FI, it is the optimized version of WI-FI .
- Li-Fi is a Visible Light Communications (VLC) system.
- LI-FI is transmission of data through illumination, sending data through a LED light bulb that varies intensity faster than human eye can follow.

- This technology uses a part of the electromagnetic spectrum that is still under-utilized- The Visible Spectrum.
- When the LED is on, you transmit a digital 1, if its off you transmit a 0.

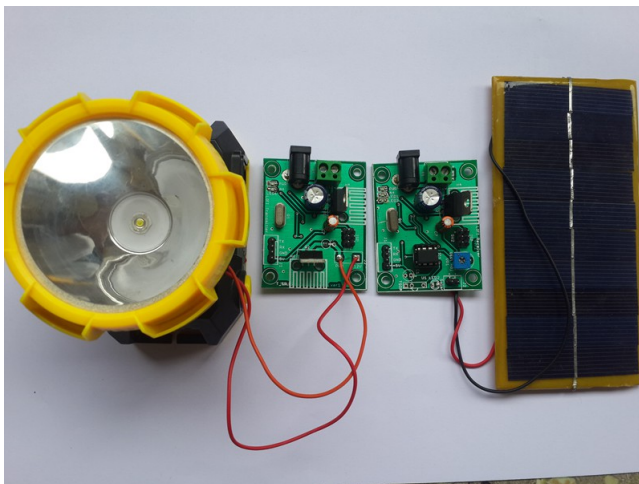


# Working of Li-Fi

- The heart of this technology is a new generation high brightness LEDs.
- Li-Fi is typically implemented using white LED light bulbs at the downlink trans-mitter.
- If LED is ON, digital data 1 is transmitted if LED is OFF,digital data 0 is transmitted.
- Data can be encoded in the light to generate a new data stream by varying the flickering rate of the LED.

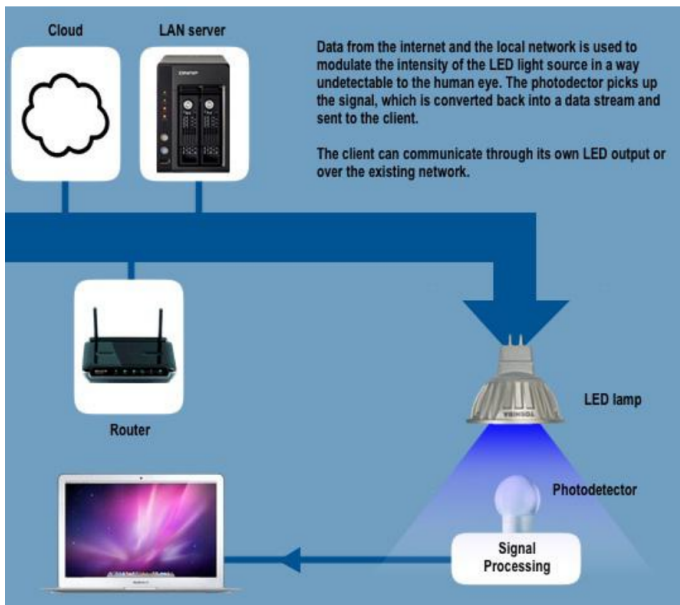


- On one end all the data on the internet will be streamed to a lamp driver when the led is turned on the microchip converts the digital data in form of light.
- Multiplexing techniques is used for high data rate which is greater than 100 Mbps is possible by using high speed LEDs.
- The photodetector picks up the signal.
- The receiver detector then converts the tiny changes in amplitude into a data stream.





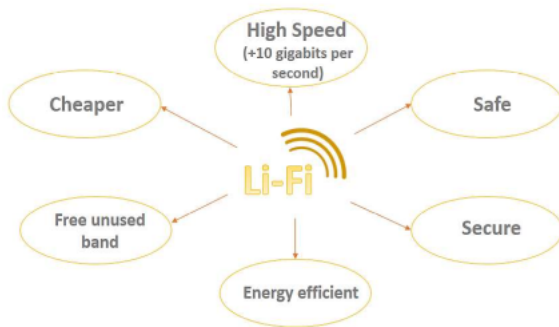
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## Comparison between Li-Fi and Wi-Fi

- Li-Fi provides with greater Bandwidth which is free and easy to use.
- Li-Fi also provides with greater data density than Wi-Fi.
- Because of above consequences output speed is also very high and its comparatively very higher than Wi-Fi.
- A Li-Fi system would be of low cost as it requires less number of components.
- Data theft or hacking is negligible compared to Wi-Fi , Li-Fi is more secure.

## Advantages of Li-Fi



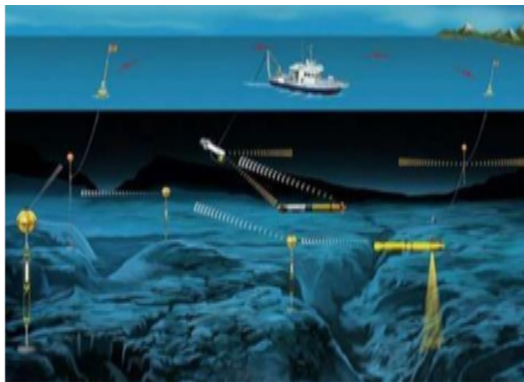
# Future Prospects and Applications

- Li-Fi is an emerging technology which is quick and reliable.
- Every single bulb can be used somewhat like a Wi-Fi hotspot to transmit wireless data and we will advance towards the cleaner, greener, safer and brighter future.
- So let's proceed to Li-Fi for a brighter and greener future.



## • Undersea Transmission

ROVs work great, except when the tether isn't long enough to explore an area, or when it gets stuck on something. If their wires were cut and replaced with light say from a submerged, high-powered lamp then they would be much freer to explore.

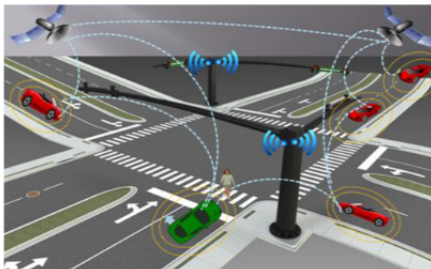


- **Safety Environment**

The use of radio devices like mobile phones in explosion hazard environments like petrochemical industries can be harmful as well as fatal. With the use of Li-Fi technology to pass data will simplify the configuration of data networks and can enable new systems to enhance security in these environments.

## • Intelligent Transport System

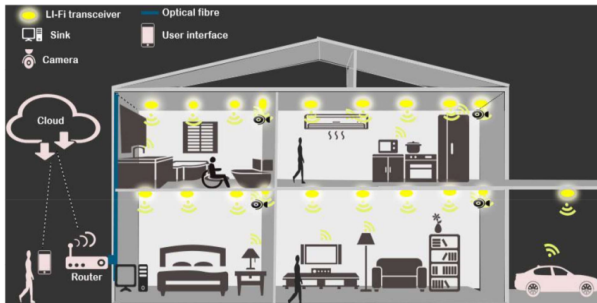
In streets for traffic control. These days the lights in cars have been replaced by LED based headlights and taillight, and Car can overcome accidents in the way that they can see the obstacle or the communication between them . Traffic light can communicate to the car and so on.





## • Smart Home/eHome

With recent advancements in IoT, people have started making their home more connected to them by connecting them to internet so that they can control it and check for the stuffs at any point of time and from anywhere. Thus Li-Fi again comes to picture as the rooms are lit properly and thus Li-fi can be efficient and cheaper and more secure within the walls of the home.



# Conclusion...

- Li-Fi is the upcoming and on growing technology ,acting as competent for various other developing and already invented technologies.
- The concept of Li-Fi is currently attracting a great deal of interest, not least because it may offer a genuine and very efficient alternative to radio-based wireless.
- If this technology can be put into practical use , every bulb can be used something like a Wi-Fi hotspots to transmit wireless data.

# Conclusion...

- As a population increase and their any devices access wireless internet, the airwaves are becoming increasingly clogged, making it more and more difficult to get a reliable, high-speed signal. This may solve issues such as the shortage of radio-frequency bandwidth.
- we will proceed toward the cleaner, greener, safer and brighter future.

# For Further Reading I



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# For Further Reading II



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# Thank You