

Comparative Study on Li-Fi Technology

¹Mr.P.Balaji, ²Mrs.M.Angelin Rosy, ³Ms.M.Sivaranjini

^{1,2}Assistant Professor, Department of MCA, ³Student

^{1,2,3}Er.Perumal Manimekalai College of Engineering, India

Abstract - Li-Fi stands for Light-Fidelity. Li-Fi technology, proposed by the German physicist—Harald Haas, provides transmission of data through illumination by sending data through an LED light bulb that varies in intensity faster than the human eye can follow. This paper focuses on developing a Li-Fi based system and analyzes its performance with respect to existing technology. Wi-Fi is great for general wireless coverage within buildings, whereas Li-Fi is ideal for high density wireless data coverage in confined area and for relieving radio interference issues. Li-Fi is a visible light communications system. Li-Fi bulbs are outfitted with a chip that modulates the light imperceptibly for optical data transmission. speed of 100 times faster in testing. large amount of radio spectrum.

Keywords - wireless converge, high density, 100 times faster testing, radio spectrum, bulb intensity.

I. INTRODUCTION

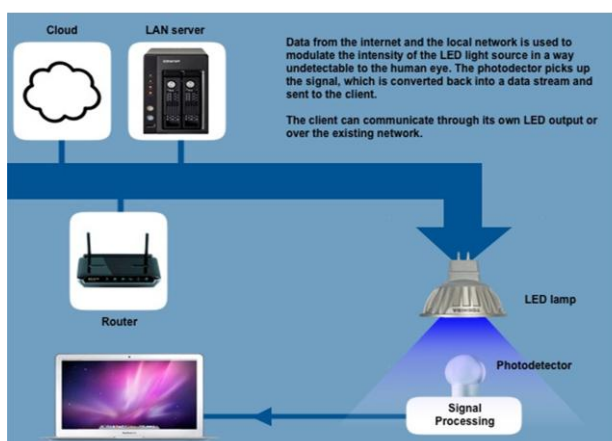
Li-Fi is a wireless optical networking technology that uses light-emitting diodes (LEDs) for data transmission. Li-Fi is designed to use LED light bulbs similar to those currently in use in many energy-conscious homes and offices. However, Li-Fi bulbs are outfitted with a chip that modulates the light imperceptibly for optical data transmission. Li-Fi data is transmitted by the LED bulbs and received by photoreceptors.

II. HISTORY

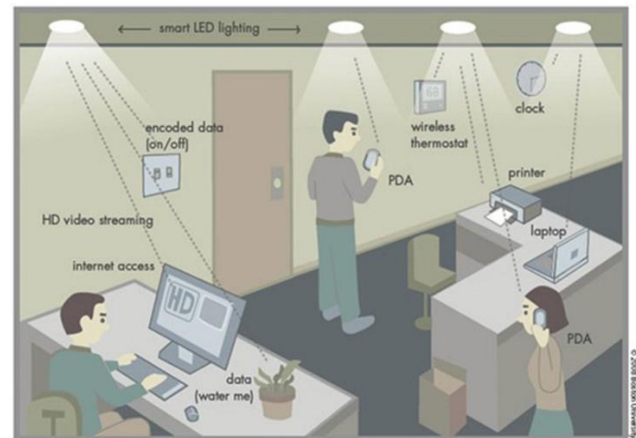
Professor Harald Haas, from the University of Edinburgh in the UK, is widely recognized as the original founder of Li-Fi. He coined the term Li-Fi and is Chair of Mobile Communications at the University of Edinburgh and co-founder of pure Li-Fi. Haas promoted this technology in his 2011 TED Global talk and helped start a company to market it. In October 2011, companies and industry groups formed the Li-Fi Consortium, to promote high-speed optical wireless systems. The first Li-Fi Smartphone prototype was presented at the Consumer Electronics Show in Las Vegas from January 7–10 in 2014.

III. HOW LI-FI WORKS

HOW LI-FI WORKS:



IV. REAL TIME USAGE OF LI-FI



V. COMPARISON BETWEEN VARIOUS TECHNOLOGIES

Wireless(Current)

Fire wire	800 Mbps
USB 3.0	5 Gbps
Thunderbolt	20 Gbps

Wireless(Current)

Wi-Fi	150 Mbps
Bluetooth	3 Gbps
IrDA	4 Gbps

Wireless(Future)

Li-Fi	10 Gbps
Giga-IR	1 Gbps
Wi-Gig	2Gbps

VI. HOW IT IS DIFFERENT

Li-Fi technology is based on LEDs for the transfer of data. The transfer of the data can be with the help of all kinds of light, no matter the part of the spectrum that they belong. That is, the light can belong to the invisible, ultraviolet or the visible part of the spectrum.

VII. APPLICATIONS

- You Might Just Live Longer
- Airlines
- Smarter Power Plants
- Undersea Awesomeness
- It Could Keep You Informed and Save Lives

VIII. WIFI VS LI-FI

Li-Fi can be thought of as a light-based Wi-Fi. That is, it uses light instead of radio waves to transmit information. Instead of Wi-Fi modems, Li-Fi would use transceiver-fitted LED lamps that can light a room as well as transmit and receive information. Wi-Fi is great for general wireless coverage within building and Li-Fi is ideal for high density wireless data coverage in confined area and for relieving radio interference issues. So the two technologies can be considered complimentary.

IX. ADVANTAGES OF LI-FI

- Li-Fi can solve problems related to the insufficiency of radio frequency bandwidth because this technology uses Visible light spectrum that has still not been greatly utilized.
- High data transmission rates of up to 10Gbps can be achieved.
- Since light cannot penetrate walls, it provides privacy and security that Wi-Fi cannot.
- Li-Fi has low implementation and maintenance costs.

X. DISADVANTAGES

- Light can't pass through objects.
- A major challenge facing Li-Fi is how the receiving device will transmit back to transmitter.
- High installation cost of the VLC systems.
- Interferences from external light sources like sun, light, normal bulbs, opaque materials.

CONCLUSION



The possibilities are numerous and can be explored further. If this technology can be put into practical use, every bulb can be used something like a Wi-Fi hotspot to transmit wireless data and we will proceed toward the cleaner, greener, safer and brighter future.

References

- [1] International Journal of Engineering Science and Computing, April 2016 4245 <http://ijesc.org/> (PDF) Study on Li-Fi Technology: Obstacles and Potentials.

Available from:
https://www.researchgate.net/publication/301814899_Study_on_Li-Fi_Technology_Obstacles_and_Potentials
[accessed Aug 30 2018].

- [2] (PDF) Latest advancement in Light Fidelity (Li-Fi) Technology. Available from:
https://www.researchgate.net/publication/322616897_Latest_advancement_in_Light_Fidelity_Li-Fi_Technology
[accessed Aug 30 2018].

- [3] Recent Advancements In Li-Fi Technology lakshata M Sonnad, 2anjana Gopan, 3 Sailakshmi N R, 4divya S, 5ambika R Bmsit 1 akshatasonnad@gmail.com, 2 anjanagpn@gmail.com, 3 dhanya1192@gmail.com, 4 divya.sudarsanam@gmail.com, 5 ambika2810@gmail.com.

- [4] <https://www.lifi.eng.ed.ac.uk/>.

- [5] <https://www.lifi.eng.ed.ac.uk/lifi-news?page=1>.