

Light Fidelity Technology (LiFi): An Overview and Its Application

¹Abha Sharma, ²Vivek Kumar Jethani, ³Akarsh Sharma, ⁴Abhishek Kapoor, ⁵Ayush Sharma

¹Assistant Professor, Department of ECE, Arya College of Engineering & Research Centre, Jaipur

²Assistant Professor, Department of CSE, Arya College of Engineering & Research Centre, Jaipur

^{3,4,5}B.Tech Student, Department of CSE, Arya College of Engineering & Research Centre, Jaipur

sharmaabha0307@gmail.com, vivekkrjethani@gmail.com, akarshsharma74@gmail.com, abhikapoor2000.ak@gmail.com, as8985719@gmail.com

Abstract: when we use a public Wi-Fi or sharing it with a friend or someone nearby we might possibly get irritated because of the slow speed of the internet connection in our devices. This is a major issue when we are performing anything important so in order to counter this problem, a physicist from Germany herald haas invented an all new way of data transmission known as “Data Through The Illumination” in which the data is transmitted from LED lights which have faster intensities than the human eye. Herald has stated that this technology is based upon the light emitting diodes potential and intensity. In this paper give an overview about the LiFi Technology, its working, application, advantage and disadvantage of the LiFi Technology in details.

Keywords: LiFi, LED, WiFi, High Data Rate, Wireless, Diode.

1. Introduction

When considering the today's world scenario, one can't even imagine a life without an internet connection. On the internet we share a huge amount of data either it can be an audio files, video files or any form of data so in order to transfer this huge amount of data a good internet connection speed is required which can give a good sharing capacity [1].

Presently radio waves can be utilized for wireless communication. Range is an authoritative prerequisite for wireless communication. With time and the progression of innovation, the quantity of clients has expanded and the current radio recurrence range doesn't address the issues of the Internet. To resolve these issues of adaptability, accessibility, and security, the hypothesis of utilizing LED lights that can communicate wirelessly, called Li-Fi, emerges. It utilizes a LED bulb to send information at a lot quicker speed contrasted with Wi-Fi. Gigahertz radio waves won't be utilized to move information. Utilize apparent light for information change [2].

In a light fidelity technology, the lights act as a high speed source of communication which is as same as Wi-Fi technology. The LI-FI technology is also considered as a secure way of data transmission as the light cannot be passed through the walls. Visible lights are used in this technology rather than the radio waves for the data transmission which is used in wireless fidelity. LI-FI is considered as an affordable way of data transmission technology as the light

medium does not cost as much as any other technology and can also conserve more electricity [3].

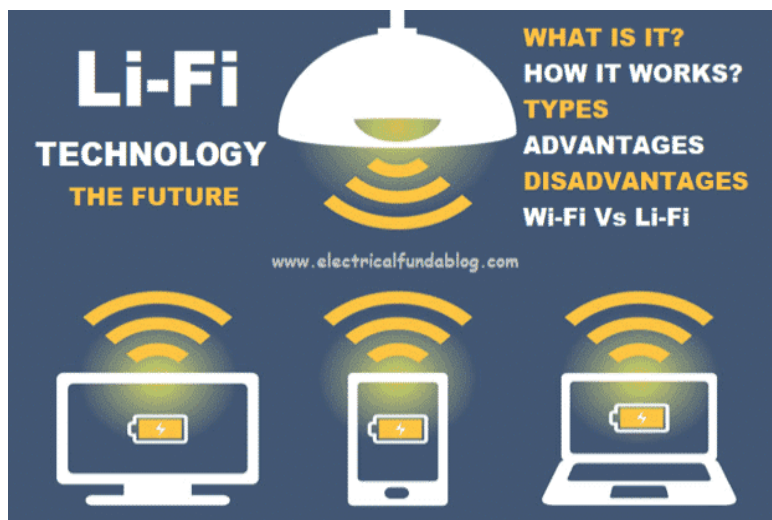


Fig. 1: LIFI Technology Overview

2. How LiFi Technology Works

Light loyalty innovation is one amongst the good speed and conservative style of communicating the knowledge and this innovation relies on the VLC [4]. The many parts of this framework are –

- 1) An LED light which might act as a wellspring of data transmission.
- 2) A "Silicon Photo-diode" might provide a response to the frequencies of getting components.

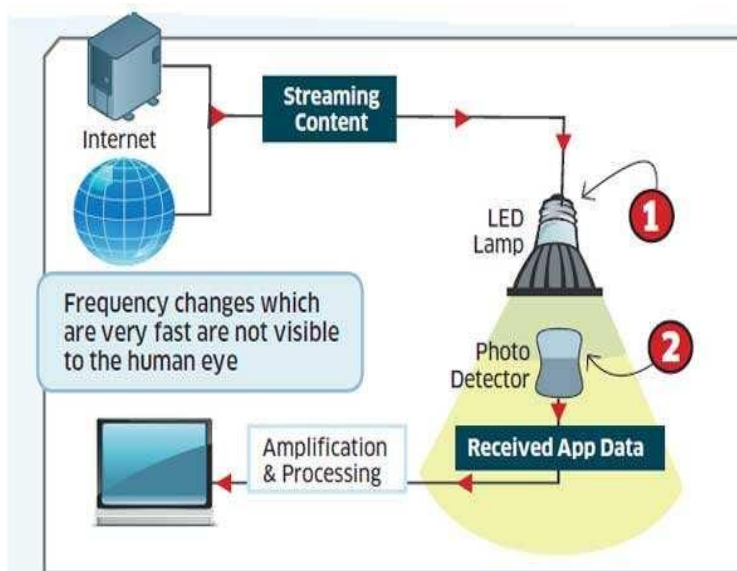


Fig.2: Working of Li-Fi

Stream graph of sunshine-Fidelity the stream outline of light constancy contains chiefly two-section transmitter beneficiary. the data which is outfit at transmitter side is managed with a

chose proportion of your time and after this, it sends the data with the assistance of light exuding diode (LED) bulbs as nothing's and one's and lightweight releasing diode (LED) bulbs are streaks with nothings and one's. likewise, it gets a sign and produces yield at the beneficiary side with the assistance of Photo-Diode. The transmitter segment of Li-Fi contains input, a clock circuit, and a LED blub. the data feed at transmitter side is any form of information (for example Text, Voice)

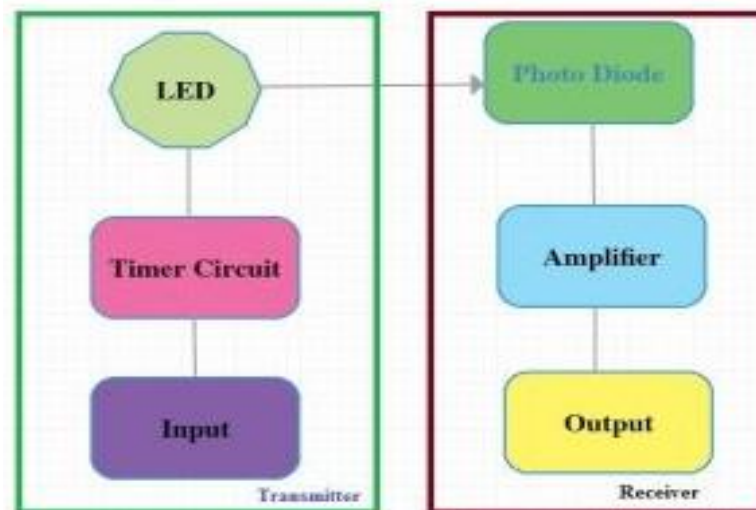


Fig.3: Stream Graph of Li-Fi Use of Light-Constancy Framework

3. Application of LiFi

There are various importance application of the LiFi but in that some the important application of the LiFi are as follows [5-7]:

- ❖ LiFi Module for Audio Applications
- ❖ Transportations
- ❖ Industrial areas
- ❖ Road safety and Traffic Management
- ❖ Medical Applications
- ❖ Aviation
- ❖ Under water communication
- ❖ Location based services
- ❖ RF spectrum
- ❖ Mobile connectivity
- ❖ Smart light

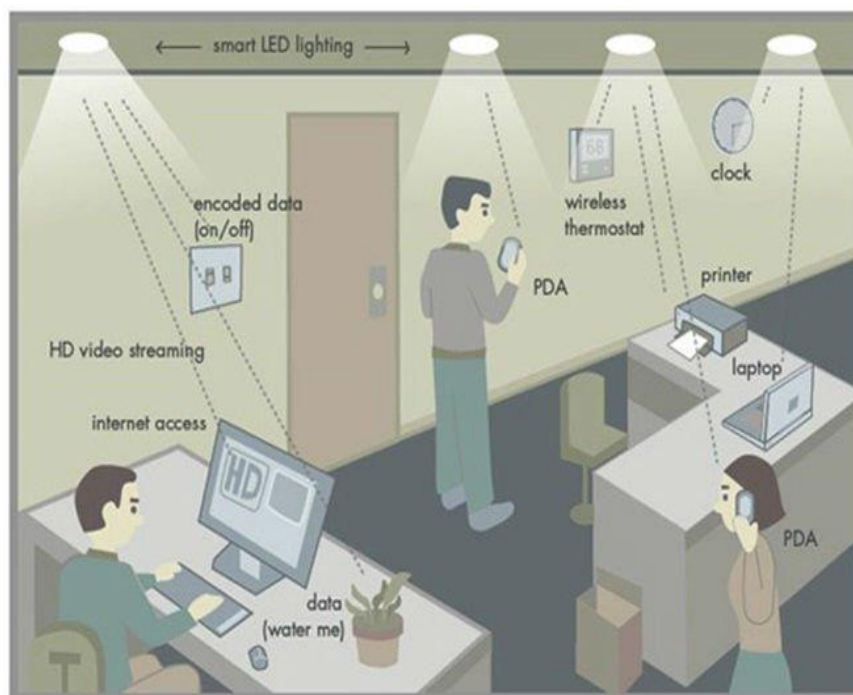


Fig. 4: Applications of Li-Fi

4. Advantage of Li-Fi

The properties of light give Li-Fi obvious benefits. As of now referenced, it gives an amazingly wide unregulated range which can be abused to accomplish high information rates, particularly by communicating information at equal frequencies [8]. Advantages of Li-Fi there's the different good thing about Li-Fi Technology a number of them given below:

- ❖ **Risk free:** The Li-Fi system works on light waves which is not harmful for humans that's why the Li-Fi system is free from risk. The Li-Fi technology works or operates on optic bands which are harmless.
- ❖ **Consistent:** The Li-Fi system is protected during transfer data.
- ❖ **Security:** The Li-Fi system is protected and in Li-Fi system there is zero possibility of hacking because the Light-Fidelity system does not operate through the partition.
- ❖ **Speed:** If we talk about speed of Light-Fidelity system is much higher as compared to Wireless-Fidelity system so uses of Li-Fi can watch videos or download big data without buffering.
- ❖ **Power consumption:** The consumption of power in Light-Fidelity System is low that's why it is used in IoT applications.
- ❖ **Installation:** the installation process of Li-Fi technology is easy.

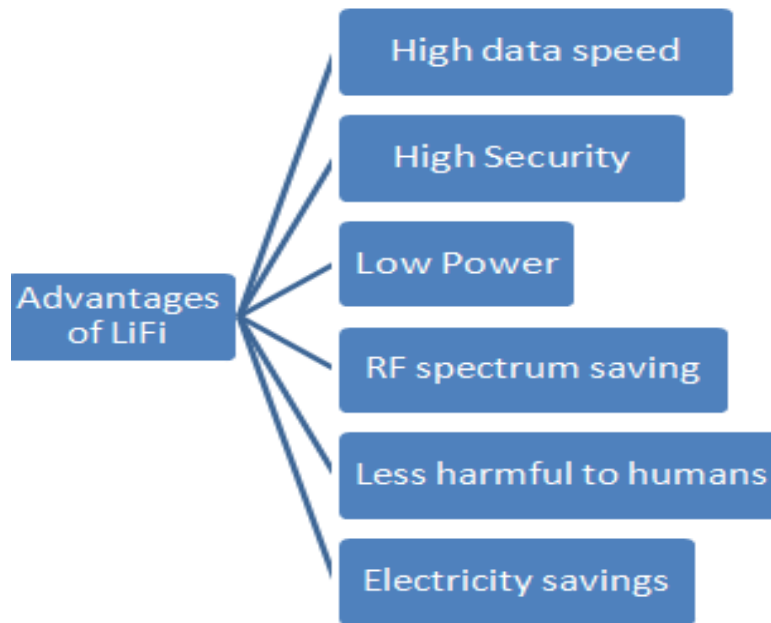


Fig.5: Advantages of LI-FI

5. Disadvantage of Light-Fidelity System

The sunshine devotion system consists of various dis-advantage a number of them given below:

- ❖ The Light-Fidelitysystem not able to work in dim light areas.
- ❖ Light Cannot pass through objects.
- ❖ The major disadvantage of Light Fidelitysystem is Light-Fidelitysystem require Line-of-sight.
- ❖ The coverage area of Light-Fidelity technology is limited because light can't pass through wall.
- ❖ Li-Fi system is also affected by weather.
- ❖ The installation cost of VLC systems is high

6. Conclusion

Based on a research the LI-FI technology has shown many benefits such as power consumption and majorly the transmission of the data at a very high speed. If this technology is implemented in real world, then every light source can work as a source of data transmission or like an internet hotspot which can also result in a more economical and a bright tomorrow. The Light-Fidelity is latest or new concept to the younger generation and it getting a lot of attention from the youngsters as it gives us many benefits over a traditional radio based wireless fidelity. As we all know that the number of devices a single person use are gradually increasing such as wearable's which are needed to be connected to a good speed of internet all the time son light-fidelity technology can use to solve this difficulty to get a high speed connectivity. In this paper give an overview about the LiFi Technology, its advantage and disadvantages. In this also discussed the application of the LiFi technology in real world.

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