

Li-Fi: Turn on Your Light

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Abstract: *Turn on your light not just to light up the darkness but also to transmit data through your light specifically a LED light .this what we call light fidelity li-fi. Technology that transmit data through LED light. In this paper we will handle this unique technology that definitely will change our life.*

Keywords: VLC (visible light communication), LED (light emitting diode), LI-FI (light fidelity), WI-FI (wireless fidelity), TED (Technology Entertainment and Design)

1. Introduction

Internet has become a part and parcel of our life, we can't spend a day without the internet, it is very useful on massive scale, it makes the far-fetched accessible, plus that we always look for the things that facilitate our life, now a days the transfer of data and information is very important, hence the imperative need of fast data transmitting is increasing, Li-fi is introduced by Harald Haas in 2011 TED Global talk on Visible Light Communication. [1]

Li-fi stands for light fidelity, it is very unique technology that uses the light emitting diode for data transmitting. LED has become the best form of lighting due to its unique characteristics.

2. Visible Light Communication

Beacon fires and smoke signals that contain a message was created before along time as form of optical communication. In optical communication we use the light as the transmission medium. Visible light communication (VLC) is technology that offers optical communication by using visible light. VLC can be alternative to different radio frequency based communication services. This can be done due to the advantage of LED light that can switch OFF and ON rapidly without Been notice by the human eye. There are in calculable number of light bulbs are in use worldwide. So if we use LEDs light instead of normal bulbs we will save one billion barrels of oil every year. [3]

3. Light Fidelity

LI-FI introduced in 2011 TED global talk by proof harald haas, he grabbed the attention of the attendee by streaming HD video from a stander LED lamp. "It was a moment of eternal joy" says harald haas. Li-fi uses LED light due to its many advantages such as Long life, small volume, low power consumption and low heat radiation.

Plus that LEDs can switch OFF or ON in very high speed that a human's eye can't noticed, so this gives a great opportunities for transmitting data. [1]

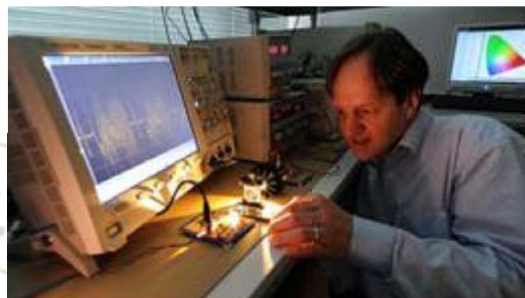


Figure 1: Proof Harald haas

4. How it work?

Harald haas describes the first implementation of li-fi technology in front of TED Global talk attendee as "a moment of eternal joy" he surprises the audience by streaming HD video from stander LED lamp.

To explain how this unique technology works firstly we uses data from the internet and it send to the server to LAM driver which have a software code on it that confers the data to binary light flickers. LAM driver connects to LED .LED's have a unique advantage that can flicker "OFF" or "ON" in very high speed .so "ON" signifies a binary "1" and "OFF" signifies a binary "0".

The frequency of these "ON" and "OFF" sequences is so high that the human eye can't see the light changing, so for us the light remains "ON" all the time.

The photo reception receives these flickers and amplitudes them. [4]

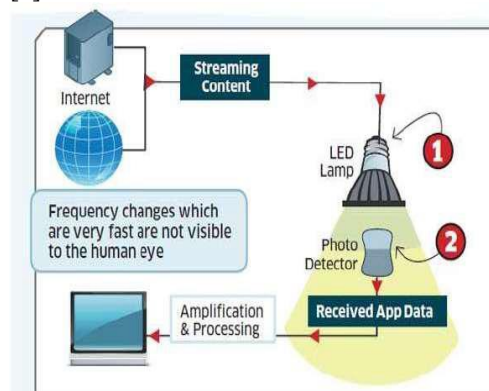


Figure 2: How li-fi work

5. What makes li-fi different

Wi-Fi is the most prominent technology that uses radio waves to provide network connectivity and transmits data in very high speed. Imagine a technology that play the same role of Wi-Fi but it use the light instead of radio frequency. In this unique technology we can use any form of light sources in shopping windows, in street light, in trains, in traffic light, in home and in everywhere of light we will have means of communicating in a very high speed that could reach 10gbps in Labe condition according to researchers.

6. LI-FI Application

6.1 Security

Light can't penetrate walls. It mean that the light in my room that is transmit data no one in the other room can read my data. There is only data where is light.

6.2 Hospital and healthcare

Wi-Fi can cause interference with monitoring equipment in hospitals .so it's strictly forbidden to use Wi-Fi in hospital and health care .but in the other hand li-fi can implemented in hospitals and operating rooms without problems.

6.3 Li-Fi in aircrafts

Li-Fi can be used for data transmission and can provide high speed internet using the every can find in aircraft.

6.4 Under water application

Li-Fi can work underwater in view of light can penetrate for large distances.

6.5 Smart lamps

Any lighting such as street lamps can be used to provide Li-Fi hotspots and the same communication and sensor infrastructure can be used to monitor and control lighting and data.

6.6 Traffic control

Car headlights and tail lights are steadily being replaced with LED versions. This allowing development of anti-collision systems and exchange of information on driving conditions between vehicles.

7. Future Scope

• Li-Fi and Solar Cells

For the first time in public at the 2015 TED global conference in London. Proof harald haas show the attendee how light emitted by an LED could make a video play on a computer connected to a solar panel.

So there will be enormous energy saving that can be made by using solar power to deliver the energy for wireless. "A massive extension of the internet "said proof haas. [5]

• Li-fi in Dubai

Dubai will be the first city in the world to use li-fi technology in the end of this year. Li-fi service will be transmitted through city's streetlights.

8. Conclusion

Li-fi technology is the future. Perhaps That Will make sweeping change in our daily life .So if this technology can be put into practical use, every form of lighting can be used something like a Wi-Fi hotspot to transmit wireless data literally just let there be light.

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