

LI-FI: A New Era Of Wireless Communication Data Sharing

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Abstract: There is significant increase in traffic on the network and hence its complexity increases. Due to which there is shortage of radio bandwidth. Wireless communication is something which has to be fast, safe, reliable and free from error. LI-FI or 'light fidelity' is the method which is derived to overcome these problems.

Keywords: data sharing, li-fi, wireless communication.

1. INTRODUCTION

A new era in wireless communication is soon going to hit the world. A German physicist, Harald Hass who evolved a method to transfer data through illumination which he called it as D-light (or LI-FI). LI-FI which is a very advanced version of WI-FI is basically 'light fidelity' which uses visible light communication instead of radio wave communication as in WI-FI. As speed of light is way faster than radio waves hence it can be used with a speed of around 250 times more than any high speed broadband. Day by day use of internet is increasing and hence traffic is increasing. The disadvantage of WIFI:

1. It covers Small distance
2. More traffic slower speed
3. costly

These limitations are overcome by LI-FI which can be used for:

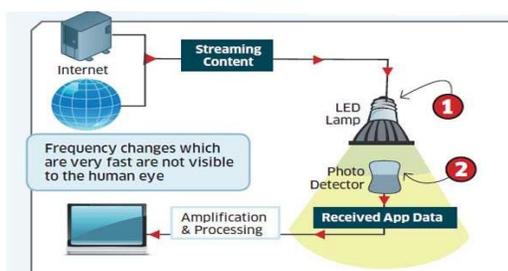
1. large coverage of area
2. traffic handling capacity
3. cheaper

Now the question arises that how it transmits data?

It transmits data through LED's (light emitting diode's) which changes its intensity faster than human eye and that intensity is captured by a detector. Estimated transmission of data is around 10GBps. A recent project in foreign universities proved that: The Ultra-Parallel Visible Light Communications Project in which several universities together have achieved 3.5GBps of the three primary colors from a small LED. Combined, this makes a total in excess of 10GBps of what is known as "LiFi".

2. WORKING OF LIFI

The functioning of Li-Fi is simple, yet amazing. You just need two things, first is LED (which acts as a light source) and other is photo detector (a light sensor for capturing light).



When light source starts to emit light, light sensor on other end will detect it and get a binary 1 otherwise binary 0. LED flashes certain time and builds up a message. Light sensor detects the light flashing of light and receives the message.

TABLE 1 LIFI in all aspects is way better than WIFI

S.NO.	BASIS OF COMPARISON	WIFI	LIFI
1.	Security	Not secured (can be hacked)	Secured (cannot be hacked)
2.	Data transmission rate	Slower (uses radio waves)	Much faster (uses visible light)
3.	Range	Small	Large
4.	Traffic control	Less (signal become weaker as traffic increases)	More (due to high speed & easy availability)
5.	Where can be used	Within a range of WLAN infrastructure, usually inside a building	Anywhere, where light source is present
6.	Cost	Costly	Cheap
7.	Working concept	various topologies	direct binary data serving

2.1 COMPARITIVE STUDY BETWEEN LIFI AND WIFI:

3. DISADVANTAGES OF LIFI:

Nothing in this world is perfect and so does LIFI.

1. These signals cannot penetrate walls. So the person needs wired bulb in that room also.
2. Only works if there is direct line of sight between source and receiver.

4. ADVANTAGES OF LIFI:

1. Radio waves are harmful for human beings as they penetrate the body and may cause mutation. So it is safe.
2. It is very secure (no-body can hack it,) since no signal penetration through walls.
3. Tremendous data transfer rates.
4. It works under water, so it is beneficial in many fields.

Because of these advantages wireless technology is going to hit an upper level.

5. Applications of LIFI :

1. **Underwater communications:** Since radio waves cannot be used under water because these waves are strongly absorbed by sea water within feet of their transmission and this renders it unusable underwater but LIFI is suitable for underwater communication
2. **Health sector:** Since WIFI is not safe to be used in hospitals and other various health care sectors because it penetrates human body. LIFI can be implemented and well suit in this sector.
3. **Internet anywhere:** street lamps, light of vehicles can be used to access internet anywhere in footpaths, roads, malls, anywhere where light source is available.
4. **Safety and management:** it can be used to update traffic information at almost every instant and it will be easy for traffic police to deal with traffic and catch the one who breaks the rule.

6. Conclusions:

1. Although LIFI has some disadvantages but it shows epic advancement in the world of wireless technology. It hits almost all sectors and definitely going to be boon for our society. LIFI technology has shown lots of improvements since it has discovered. So these signal will provide many facilities in future like:
2. We can access internet anywhere in streets, footpaths, house, etc. with the help of available light source such as tube-light, lamps, street-lights etc.
3. Since LED's are fast switching easily available cheap low power consumption and hence can be used in large amount to transfer data in a mere blink of an eye.
4. In field of data electronics, it provides ample ways to transfer signals and it's relative data to the greatest accuracy and in the most precise way.
5. Communicating and obtaining data from satellite will be more easy than ever before.
6. It will be beneficial for defence services as their data is very confidential and LIFI cannot be hacked so data is protected. For marine commandos, who operates under water can send important commands to other areas (either under water or in land etc.) since LIFI signals works under water. With the hands provided by LIFI we will be future ready.

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