DATA TRANSMISSION USING LIFI TECHNOLOGY

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Introduction

-LIFI : With the vast growing gadgets, their usage and their developments led to the advancement in the Wi-Fi which provides a technology so called Li-Fi.
-Li-Fi is a technology that makes use of LED light which helps in the transmission of data much faster and flexible than data that can be transmitted through Wi-Fi.
-Light Fidelity is a branch of optical wireless communication which is an emerging technology.

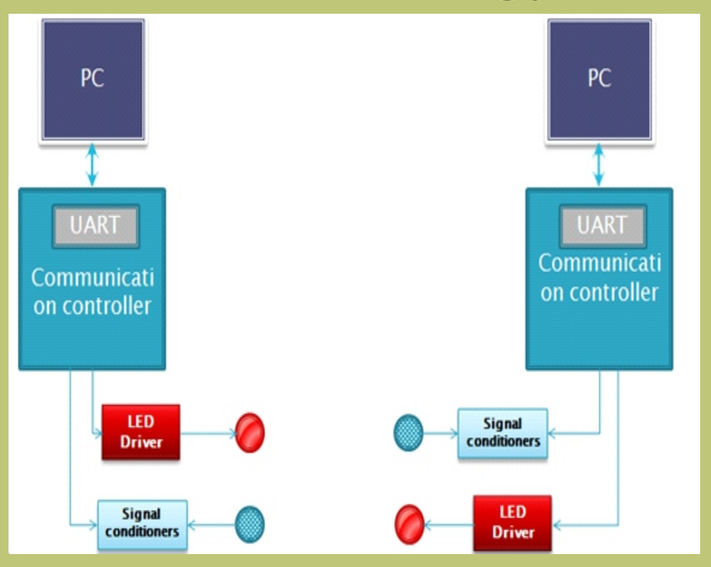
Aim and Objective

1-Provide fast and secure network connection.
2- Demonstrate basic working of LIFI using
a two player game and chat system.
3-To lower the power consumption of WIFI.

Motivation

The most important day-to-day activities in this fast world are the transfer of data and information. As the world is becoming faster the need of fast data transmission is also increasing. As the numbers of devices that access to the internet are increasing, the limited bandwidth leads to decrease in the speed of the data transfer.
To give a solution to this problem Li-Fi technology is introduced.

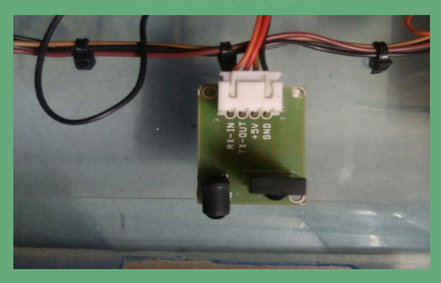
Methodology

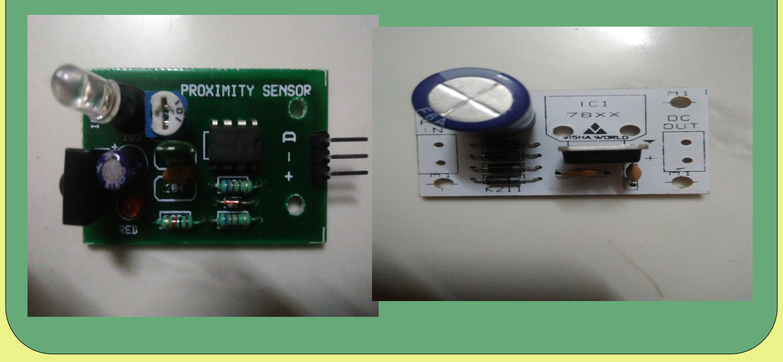


Advantages

Capacity: Light itself has 10000 times wider bandwidth than radio waves. Due to which the transfer of data is more effectively possible. So li-fi has better capacity.
Efficiency: LED lights consume less energy and very efficient. As it uses less energy it is cheap and easy to use.
Security: Light waves cannot penetrate through walls. So they cannot be misused.
Availability: As light is present everywhere, Li-fi is available everywhere. But for more efficient use of li-fi technology LED bulbs must be placed for proper transmission.
Data Density: Li-Fi can achieve about 1000 times the data density of Wi-Fi because visible light can be well contained in the tight illumination area.

Result





Li-Fi vs. Wi-Fi

Parameter	Li-Fi	Wi-Fi
Medium through which data transfer	Light medium	Radio waves
Privacy	In Li-Fi, light is blocked by the walls and hence will provide more secure data transfer	In Wi-Fi, RF signal can not be blocked by the walls and hence need to employ techniques to achieve secure data transfer.
Data Transfer Speed	About 1Gbps	150Mbps
Frequency of operation	100THz	2.4GHz, 4.9GHz and 5GHz
Coverage distance	About 10 meters	About 32 meters (WLAN 802.11b/11g), vary based on transmit power and antenna type

Disadvantages

As li-fi technology uses light as transmission medium, so if the receiver is somehow blocked in a way then the signal will immediately will be cut out.
As Li-fi works in direct line of slight. Slight disturbance can cause to interruption

Conclusion

•Bulbs can be used as an alternative to hotspots.
•It provides simple, faster and efficient wireless data communication.
•Li-Fi will make us to proceed towards the cleaner and brighter, safer future.

Applications

Education System: Li-fi is the latest technology that can provide fastest speed internet access. So it can replace the Wi-Fi at Educational Institution and at companies so that they can use the same internet with more fast speed.
Medical applications: As Wi-Fi uses radiations waves which can cause hazardous to the patients in OT (Operation Theatres) while radioactive operations.
Underwater Applications: Li-fi can work underwater where Wi-Fi fails completely, thereby providing open endless opportunities for military operations.

References

[1] IEEE Paper on Li-Fi Integrated to Power-lines for Smart Illumination Cum Communication.
[2] IEEE Paper on Li-Fi: line-of- sight identification with Wi-Fi.
[3] IEEE Paper on Integrated Transceivers for Optical Wireless Communications.
[4] IEEE Paper on LiFi Integrated to Power-lines for Smart Illumination Cum Communication.