

LI-FI TECHNOLOGY

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Abstract

Nowadays many people are taking interest as to accomplish their tasks through wired or wireless networks. As numbers of users get increased in wireless network the speed reduces proportionally. Though Wi-Fi gives us speed up to 150 Mbps as per IEEE 802.11n, it is still insufficient to accommodate desired no of users. To remedy this limitation, we are introducing the concept of Li-Fi. As per German physicist Harald Haas "data through illumination" –taking the fiber out of fiber optic by sending data through an LED light bulb that varies in intensity faster than the human eyes can follow. It's the same idea based behind the infrared remote controls but far more powerful. Haas says his invention, which he calls D-LIGHT, can produce data rates faster than 10 Mbps, which is speedier than average broadband connection. Twentieth century is an era of internet. Most of the communications happen over the internet. Wi-Fi is the currently most advanced technology that is being widely used for connecting to the internet. The speed and the number of users that can connect at a time are limited in Wi-Fi. Our project is about visible light communication. This communication happens using light as a medium. As light is going to act as a medium the speed will be tremendous for data transmissions. Not only speed but also the security in a closed environment will increase with the use of Li-Fi. Our project aims at exploring the use of Li-Fi also known as optical wireless communication.

Keywords: Wireless-Fidelity (Wi-Fi), Light Fidelity (Li-Fi), Light Emitting Diode (LED), Illumination, D-LIGHT)

I. INTRODUCTION

Li-Fi or Light Fidelity is a high speed, bidirectional and fully networked subsets of visual light communications (VLC). It uses visible light communication instead of radio frequency (RF) waves which carry more information. Thus Li-Fi is an emergent technology that has the potential to deliver enormous bandwidth. As data transmission through radio waves approaches its limits, a new medium presents itself. Most of us are familiar with Wi-Fi (Wireless Fidelity) uses 2.4-5 GHz RF to deliver wireless data, information or internet access around. It can cover up a large area, but it fails to cover up all the area as its bandwidth is typically limited to 50-100 megabits per second (Mbps). This is a good match to the speed of internet services, but insufficient for moving large data files like HDTV movies, music libraries and video games. The bandwidth and speed is directly proportional medium of communication. Therefore RF-based technologies such as today's Wi-Fi are not the optimal way. In addition to that Wi-Fi fails to provide new desired capabilities such as precision indoor positioning and gesture recognition. To this a new trend has come in technology that overcomes these flaws, that is Li-Fi or Light Fidelity. This is also called as visible light communication and informally known as optical wireless technology, a vivid permutation of speed, reliability, flexibility and usability. Li-Fi is transmission of data through illumination by taking the fibre out of fibre optics by sending data through a LED light bulb that varies in intensity faster than the human eye can follow. Li-Fi is the term some used to label the fast and cheap wireless communication system which is the optical version of Wi-Fi. It is possible to encode data in the light by varying the rate at which the LEDs flicker on and off to give different strings of 0s and 1s. The LED intensity is modulated so rapidly that human eye cannot notice, so the output appears constant. More sophisticated techniques and ways could dramatically increase visible communication data rate. Li-Fi is fast two way communication that uses visible light instead of radio frequency waves for carrying data. The amount of data being carried over the visible light is far more than the radio frequency waves thus giving us more bandwidth available for using. Machine data usually refers to combinations of 0's and 1's. Thus transferring streams of 0's and 1's means transferring data and if its two ways it becomes communication. There must be a unique way to represent 0's and 1's which by using light is OFF and ON respectively. If we have a unique way to represent 0's and 1's we can operate on machine data.

2013 Ieee Paper On Li Fi Technology

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