

LIGHT FIDELITY TECHNOLOGY

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Abstract: Whether you're using wireless internet in a coffee shop, stealing it from the guy next door, or competing for bandwidth at a conference, you have probably gotten frustrated at the slow speeds you face when more than one device is tapped into the network. As more and more people and their many devices access wireless internet, clogged airwaves are going to make it. One German physicist, Harald Haas has come up with a solution he calls "data through the illumination" taking the fiber out of fiber optic by sending data through an LED light bulb that varies in intensity faster than the human eye can follow. Its same idea band behind infrared remote controls but far more powerful. Haas says his invention, which he calls D-LIGHT can produce data rates faster than 10 megabits per second, which is speedier than your average broadband connection. He envisions a future where data for laptops, smart phones, and tablets is transmitted through the light in a room. And security would be snappy if you can't see the light, you can't access the data.

Keywords: wireless internet, LED light bulb, human eye, D-LIGHT.

1. INTRODUCTION

LIFI is transmission of data through illumination by taking the fiber out of fiber optics by sending data through a LED light bulb that varies in intensity faster than the human eye can follow. The LIFI is term some have used to label the fast and cheap wireless communication system. which is the optical version of WIFI. The term was first used in this context by Harald Haas in his TED Global talk on Visible Light Communication. At the heart of his technology is a new generation of high brightness light emitting diodes, says Harald Haas from the university of Edinburgh, UK, "Very simply, if the LED is on, you transmit a digital 1, if it's off you transmit a 0," Haas says, "They can be switched on and off very quickly, which give the nice opportunities for transmitted data. '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 1s and 0s. The LED intensity is modulated so rapidly that human eye cannot notice, so the output appears constant. More sophisticated techniques could dramatically increase VLC data rate. Terms at the University Of Oxford and the University of Edinburgh are focusing on parallel data transmission using array of LEDs, where each LED transmits a different data stream. Other group are using mixtures of red, green and blue LEDs to other group are using mixtures of red, green and blue LEDs to alter the light frequency encoding a different data channel, LI-FI as it has been dubbed, has already achieved blisteringly high speed in the lab. Researchers at the Heinrich Institute in Berlin, Germany have reached data rates of over 500 megabytes per second using a standard white light LED.

2. WORKING

This brilliant idea was first showcased by Harald Haas from University of Edinburgh, UK, in his TED Global talk on VLC. He explained, "Very simple, if the LED is on, you transmit a digital 1, if it's off you transmit a 0. The LEDs can be switched on and off very quickly, which gives nice opportunities for transmitting data. 'So what you require at all are some LEDs and a controller that code data we want to encode. Further enhancements can be made in this method, like using an array of LEDs for parallel data transmission, or using mixtures of red, green and blue LEDs to alter the light's frequency with each frequency encoding a different data channel. Such advancements promise a theoretical speed of 10 Gbps-meaning you can download full high definition film in just 30 seconds. Simply awesome, But blazingly fast data rates and depleting bandwidths worldwide are not the only reasons that gives this technology an upper hand. Since LIFI uses just the light, it can be used safely in aircrafts and hospitals that are prone to interference from radio waves. This can

even work underwater where WI-FI fails completely, thereby throwing open endless opportunities for military operations. Imagine only needing to hover under a street lamp to get public internet access, or downloading a movie from the lamp on your desk. There's a new technology on the block which could, quite literally as well as metaphorically, throw light on how to meet the ever-increasing demand for high speed wireless connectivity. Radio waves are replaced by the light waves in a new method of data transmission which is being called LI-FI light emitting diodes can be switched on and off faster than human eye can detect, causing the light source to appear to be on continuously. A flickering light can be incredibly annoying, but has turned out to have its upside, being precisely what makes it possible to use light for wireless data transmission. Light – emitting diodes can be switched on and off faster than the human eye can detect, causes light source to be appear on continuously, even through it is in fact 'flickering'. This invisible on-off activity enables a kind of data transmission using binary codes: switching on an LED is a logical '1' switching it off is logical '0'. Information can be therefore be encoded in the light by varying the rate at which the LEDs flicker on and off to give different strings of 1s and 0s.

3. COMPARISION BETWEEN LI-FI AND WIFI

LIFI is a term of one used to describe visible light communication technology applied to high speed wireless communication. It acquired this name due to the similarity to WIFI, only using light instead of radio WI-FI is great general wireless coverage within buildings, and lifi is ideal for high density wireless data coverage in confined area and for relieving radio interference issues, so the two techniques can be considered complementary. Only WI-FI currently offers very high data rates. The IEEE 802.11 in most implementations provides up to 150mbit/s.

4. APPLICATIONS

1. You just may live longer
2. Airlines
3. Smarter power plants
4. Undersea Awesomeness
- 5 It could keep you informed and save lives

5. CONCLUSION

The possibilities are numerous and can be explored further. If his technology can be put into practical use, every bulb can be used something like a WI-FI hotspot to transmit wireless data and we will proceed toward the cleaner, greener, safer and brighter future. The concept of LI-FI is currently attracting a deal of interst, not least because it may offer a genuine and very efficient alternative to radio-based wireless. As a growing number of people and their many devices access wireless internet, the airwaves are becoming increasingly clogged, making it more and more difficult to get a reliable, high speed signal. This may solve issues such as the shortage of radio frequency bandwidth and also allow internet where traditional radio wireless isn't allowed such as aircraft or hospitals.

ACKNOWLEDGEMENT

It is with great pleasure and effort that I am able to present this seminar report. I have tried all my best to make this report complete in all aspects. I would like to acknowledge Dr. D. V. Rojatkar, Head of Electronics and Telecommunication Engineering Department (G.C.O.E. Chandrapur). I express my deepest sense of attitude to him for supervising my project and also providing me necessary guidance. Last but certainly not least I would like to thank my colleagues and friends for their inspiration and motivation and also those who helped me directly and indirectly for my seminar work.

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