

Shedding Light on LiFi

pureLiFi

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For many of us Wi-Fi feels omnipresent. Wireless data has become an essential commodity in our daily life, synonymous with electricity and lighting. Wi-Fi is everywhere; our neighbours have it, it's free in shops, restaurants, trains and airports. We all know and understand the benefits of Wi-Fi, but what is LiFi and why is it so significant? connected future?

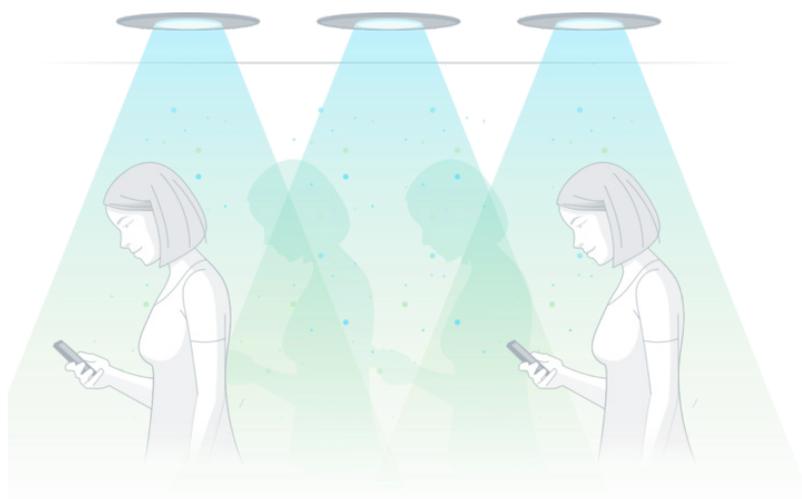
LiFi is important because it opens up a spectrum of connectivity that is 1000 times greater than Wi-Fi.



LiFi, like Wi-Fi, enables electronic devices like laptops, tablets, and smartphones to connect wirelessly to the internet. Wi-Fi achieves this using radio frequencies, but LiFi achieves this using the light spectrum which can enable unprecedented data and bandwidth.

It's important to consider that wireless data is required for more than just our traditional connected devices – today our televisions, speakers, headphones, printer's, VR goggles and even refrigerators use wireless data to connect and perform essential communications. In fact, it is predicted that by the year 2020 there will be 20 billion devices wirelessly connecting to the internet. Additionally, almost 80% of the wireless data is being consumed in the form of bandwidth intensive video that enables popular software and applications such as social media, video streaming services such as Netflix, virtual and augmented reality.

Radio frequency technology like Wi-Fi is running out of spectrum to support this digital revolution and LiFi can help power the next generation of immersive connectivity.



The difference between LiFi and Wi-Fi?

Congestion

Wi-Fi uses radio frequencies, and these are very limited. Devices computers, laptops, printers, smart TVs, smartphones and tablets must compete for bandwidth. The emergence of more and more Wi-Fi-enabled things e.g. refrigerators, watches, cameras, and offloading from cellular is causing congestion, and degrading data communications. Li-Fi uses the frequencies of light waves, which are 1000 times more plentiful than radio frequencies and do not interfere with radio frequencies.

Density

Imagine an office of 460 sq metres with 80 employees working on tablets and laptops wirelessly. Typically for every 200 square metre there would be one wireless Wi-Fi router providing approximately 1 Gbps. This would mean there would be a total of 2 Gbps for the entire office to share. However, imagine that the entire lighting structure of the office was Li-Fi enabled. Even if conservatively the office only had 100 lights in the ceiling that would provide more than 4 Gbps for the office to share and if that's not enough all you have to do is add more lights. However, you can't add more Wi-Fi routers as they interfere with each other. The amount of available data per square metre of space in a room will always be greater with Li-Fi.

Security

Radio waves pass through walls and ceilings. Light doesn't. Therein lies the difference in data security between Wi-Fi and Li-Fi. An intruder or hacker, outside a building can tap into the Wi-Fi data communications of computers inside the building. Data communicated via Li-Fi can only be accessed where the LED light illuminates.

Safety

Wi-Fi creates Electromagnetic Interference (EMI), known to interfere with airplanes' instruments and equipment in hospitals, and is potentially dangerous in hazardous operations, such as power/nuclear generation or oil and gas drilling. Li-Fi uses light instead of radio waves, which is intrinsically safe and does not create EMI.

Speed

The older versions of the Wi-Fi standard, like IEEE 802.11a/g, specify data rates up to 54Mbps. However, the newer Wi-Fi standards, like the 802.11ac provide technologies that can extend these data rates to 1Gbps and beyond. Indeed, the 802.11ad can achieve data rates of up to 7 Gbps. The University of Edinburgh, pureLiFi's partner and home to Prof. Harald Haas – "the father of Li-Fi", has shown transmission data rates of 11Gbps from a single LED. This shows great promise of this rapidly maturing technology.



for more information about LiFi visit www.pureLiFi.com

