

Wireless Communication through the Light

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Abstract: *Li-Fi stands for Light Fidelity. The technology is new and was proposed by the German physicist Harald Haas in 2011. Li-Fi (Light Fidelity) technology is a revolutionary wireless communication method that utilizes light to transmit data, offering an alternative to traditional radio frequency-based Wi-Fi. In Li-Fi systems, data is transmitted through the modulation of light intensity, typically using LED bulbs. This technology leverages the vast bandwidth of visible light spectrum, enabling high-speed data transmission with minimal interference. Li-Fi would use transceiver-fitted LED lamps that can light a room as well as transmit and receive information. Since simple light bulbs are used, there can technically be any number of access points. Light waves cannot penetrate through walls, Li-Fi offers inherent security benefits by confining signals within the physical boundaries of a room, making it more resistant to external eavesdropping or interception. Data is encoded in the light, which blinks at speeds imperceptible to the human eye, and a photodetector interprets these light changes back into data. Li-Fi can potentially offer faster data transfer speeds, reduced interference, and enhanced security, as the communication is confined to the line of sight of the light source. However, it requires direct light exposure, which limits its range and coverage compared to Wi-Fi.*

Keywords: Li-Fi, Wi-Fi, Visible Light Communication, Light-based, High-Speed Data Transfer Technology