

Li-Fi Transfer System: A Low-Cost Optical Data Communication Approach

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Abstract:

Light Fidelity is the new optical wireless communication, which is Li-Fi. It transmits data with visible light as opposed to the normal radio frequency waves. This technique makes it possible to transfer data in a safe, speedy and transparent way. In this paper, the design and development of an inexpensive Li-Fi data transfer system with LED-based optical intensity modulation is discussed. In the discussed system, a high-intensity LED is used to rapidly switch the light on and off in order to modulate digital data. At the receiver, a photodiode or solar cell captures the signal which is intensity-modulated and transforms it into electrical signals again. The system is effective in providing a short range transfer of data with consistent performance in a visual line arrangement. The proposed system has been experimentally proven to be effective. It finds use in places that hinder the RF signals like the hospital, aircraft cabins and military camps. This system provides a convenient and affordable method of exploring visible light communication and can be used to supplement the existing wireless communication systems.

Keywords:

Audio Transmission, Embedded Systems, Electromagnetic Interference-Free Communication, LED Modulation, Li-Fi, Optical Wireless Communication, Photodiode Receiver, Secure Data Transfer, Visible Light Communication (VLC).