IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Vol. 8, Issue 9, September 2019

# Wireless Communication Technology using Li-Fi

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**Abstract:** Light Fidelity (Li-Fi) is one of the hottest topics in both industry and academia of the communication engineering world. This paper gives insight into how Li-Fi can be used for wireless communication and data transfer. In this paper, we have described a project wherein we are transferring data in the form of audio signals using Li-Fi technology.

**Keywords:** Light Fidelity (Li-Fi), Wireless Communication, Light-Emitting Diode, Infrared-Emitting Diode (IRED)

## I. INTRODUCTION

Li-Fi (Light Fidelity) is a technology for wireless communication between devices using light to transmit data. LED lamps can be used for the transmission of visible light. The term was first introduced by Harald Haas during a 2011 TEDglobal talk in Edinburgh. In technical terms, Li-Fi is a visible light communications system that is capable of transmitting data at high speeds over the visible light spectrum, ultraviolet and infrared radiation. In Li-Fi project we are transferring data (audio signals) with the help of Li-Fi technology.

## II. WIRELESS COMMUNICATION TECHNOLOGY USING LI-FI

**Solar Panel:** Photovoltaic solar panels absorb sunlight as a source of energy to generate electricity. A Photovoltaic (PV) module is a packaged, connected assembly of typically 6x10 photovoltaic solar cells. Photovoltaic modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential applications.

**LED Light:** A Light-Emitting Diode (LED) is a semiconductor device that emits visible light when an electric current passes through it. The light is not particularly bright, but in most LEDs it is monochromatic, occurring at a single wavelength. The output from an LED can range from red (at a wavelength of approximately 700 nanometers) to blue-violet (about 400 nanometers). Some LEDs emit Infrared (IR) energy (830 nanometers or longer); such a device is known as an Infrared-Emitting Diode (IRED) .

**Speakers:** Speakers have an internal ampLi-Fier and consequently require a power source, which may be by a mains power supply often via an AC adapter, batteries, or a USB port (able to supply no more than 2.5W DC, 500mA at 5V). The signal input connector is often a 3.5 mm jack plug (usually color-coded lime green per the PC 99standard); RCA connectors are sometimes used, and a USB port may supply both signal and power (requiring additional circuitry, and only suitable for use with a computer). Battery-powered wireless bluetooth speakers require no connections at all. Most computers have speakers of low power and quality built in; when external speakers are connected they disable the built-in speakers.

**AUX Cables:** Auxiliary (AUX) inputs are simple audio connections that look like headphone sockets. Paired with an AUX-IN cable they will allow you to input sound from any media device with a normal headphone socket.

**9V Battery**: A constantly dc power supply of 9v is supplier by 9v battery to glow LED light.

**100 Ohm Resistors:** Resistor are the components who opposes the flow of electrons i.e. it opposes the current to flow through it . Ohm is the unit of resistance.

**Connecting Wires:** Connecting wires are made up of metal like copper for conduction of electricity . The size of wires changes as per the capacity of connecting wires changes.

**Working Principle** :- Mobile is connected to the LED light by AUX cable and supply is provided by battery to glow LED at receiver end the solar panel is connected to speakers. When music is played in mobile it will transfer that data (audio signal) to the speaker by LI-FI technology.

IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

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Vol. 8, Issue 9, September 2019

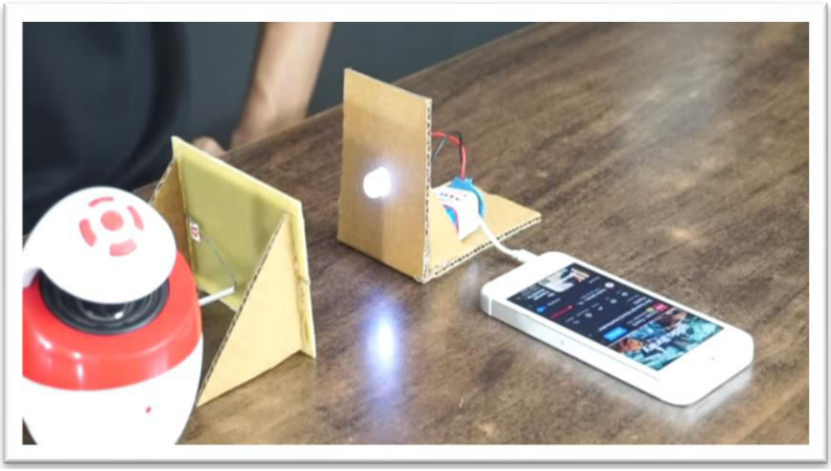

Fig. 1: Wireless Communication Technology using Li-Fi

## III. ADVANTAGES

- The speed of data transfer is about 100gbps. It is more faster than Wi-Fi
- The data shared can be in form of audio, video or any file
- It is more secure than Wi-Fi as it cannot be hacked
- There is no effect of fog present in environment on data transfer.

## IV. FUTURE SCOPE

- The Li-Fi project can be used as a network for sharing internet.
- In world we have the network of LED lights. These lights can be used as Li-Fi LEDs to transfer internet data and can be received by mobile phones laptops etc.

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