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Li-Fi in Education using Visual Light Communication (VLC) through Light Emitting Diode (LED)

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Abstract: ***Now a day's peoples are surrounded by internet and radio frequency which generate radiations and wants to access internet with high speed. The technology conversant as Li-Fi which can transform data with high bandwidth as compare as Wireless Fidelity (Wi-Fi). Li-Fi (Light Fidelity), which transform data through VLC (visual light communication) using LEDs. Faculty, Employees and Students faces lack of problems at schools and collages due to low internet access. Through Li-Fi technology we can resolve this problem with low power and cost. A technique changes any visual light into binary data for transmission. Using this technique we can transfer data with high bandwidth till 224 Gbps. With the Ascent of cloud computing, the internet at school has become strained therefore the number of devices trying to connect at once. By using of Li-Fi we can solve the problems like power inadequacy and the data devolution.***

Keywords: Radio Frequency (RF), Light Emitting Diode (LED), Visual Light Communication (VLC), Anti-radiations, photo-detector,

I. INTRODUCTION

If we talk about new technology introduced as Li-Fi there is no any physical path of data or radio frequency(RF) for communication. It covers distance across 10 meters with the speed of 250gbps; this technology covers limited distance of area. LED light cannot passes through any wall or any solid object. As compare to Wi-Fi the establishment (Li-Fi) is not costly. Transmitting data with the help of Li-Fi, generally uses LEDs that are thousands time faster than Wireless Fidelity (Wi-Fi). Now a day's almost things are available online. The evolution of wireless technology using (RF) increasing heath issue for human body, Students facing various difficulties while taking online classes in his school, collages and Universities. To take over this problem a technology is introduced called Li-Fi developed by a German scientist Harold Haas. The light from LED id detected by a light detector and the data is changed to its original form to get the required output [2]. Li-Fi uses illumination of light emitting diode (LED) bulb for sending and receiving data with high speed. Wireless technology (Li-Fi) helps in Education sector regarding to online study. Student can see their lectures online while students are not present in their class and they can see various videos which are available online. Now day's students can solve their maximum problems online while they are sitting at different places. By using Li-Fi (Light Fidelity) we can provide online classes which can be easily accessed by student. In the system, the data is transferred at higher speed with the help of available light source without use of RF dependent technologies.

II. LITERATURE REVIEW

S.M. Tanvir Abid Li-Fi Technology: Maximize the boundary of Li-Fi by Using Mirror in this paper is used to improve the boundary of the Li-Fi Technology by using concave mirror to develop the visible boundary light and this increase the distance of travelling L-Fi range [1].VLC communication is emerging as a most propitious solution for in air, underwater. As an traditional system against traditional expressional systems, VLC can instate high data rate. With this leading edge technology, data including text, video, audio, internet traffic, etc, can send and receive at high speeds using LED light. In the days where internet takes place a general demand, people are in a search for Wi-Fi hotspots. Li-Fi or New way of wireless data communication is a better choice to Wi-Fi. It is basically a5G technology of VLC (visible light communication) system which uses LED as a source of fast communication in equal manner as Wi-Fi.

III. PROPOSED WORK

My research proposing a technology which helps students to accessing internet with high speed at classroom for video streaming, video downloading, live classes, live projector streaming. Students can see their lectures after downloading videos. Students can see their old lectures whenever they are absent in the class and they can see animation videos which are more beneficial for students to understand things through animation, things became easy to understand.

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This technology increases security issues nobody can access data outside of the room because light can't passes through wall. Light cannot affect with ant-radiation so internet will be accessed continuously but in case of (RF) internet data can't be accessed with high speed. It will be more beneficial in future for making smart classes in school, colleges and universities and institutions also.

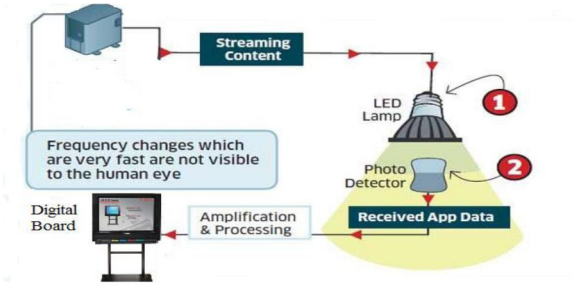

Fig. no.:1

IV. METHODOLOGY

When the electric charge is germane to a LED bulb then the LED bulb emits a contestant stream of photons which is known as visible light. Whenever LED bulb gets low electric charge then it dims up and down. To establish communication LED(Light Emitting Diode) throw light and a photo detector on computer detects light in form of binary either 1 or 0. Photo detector takes binary 1 when LED is emitting light (when LED is on) otherwise it takes binary 0

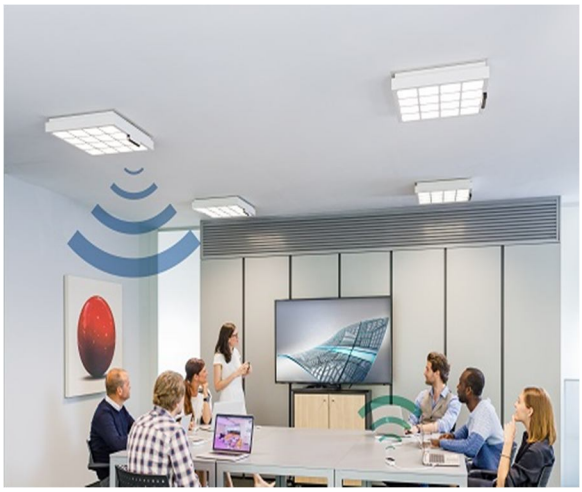

Fig. no.:2

when LED not emitted light(when LED is off).when LED is blooming continuous the data will be prepared for transmit. Photo-detector detects the flashed light and it will receive a data which data will display over the smart board by projector which is appended to the computer. Wi-Fi (Wireless Fidelity) uses radio Frequency (RF) which are very harmful for human for implementation of Wi-Fi it needs radio circuits, complex receivers and antennas but in case of Li-Fi implementation it uses LED light and uses communication devices such as Remote Control Units (RCU) and LED light is not harmful for humans. LED light can be switched on off faster as compare to human eye detect the object.

A. Advantages of LI-FI-

There are some advantages of Li-Fi which are given. We can transfer data over internet application with higher speed. Li-Fi cannot pass any solid object so it is unable to used outside of room which avoids the problem of unauthorization of Li-Fi signal devices used in Li-Fi technology requires low power to transfer data. Li-Fi uses optical spectrum instead of (RF) spectrum which was used in Wi-Fi. There is no health issue in Li-Fi which uses optical spectrum, but in case of Wi-Fi there will be health issue because it uses (RF) which is harmful for human being. Installation of Light Fidelity (Li-Fi) is very easy. Li-Fi data bits can be transmitted parallely which brings about the expanding efficiency [5].

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B. Disadvantages of Li-Fi-

We can use internet only if there is any Source of Light (SOL) is available. But light can not passes through any solid object like wall so we can't use outside of any solid object. It covers limited range as compare to Wi-Fi. Though it consumes less power, to access Li-Fi internet, electric lights source necessary to be ON all time. So there will be only waste electricity of as compare to other internet system. We cannot watch videos and games on computer devices in dark night.

V. CONCLUSION

Li-Fi provides a way of communication over internet using visual light communication (VLC) and a alternative for Wi-Fi. Li-Fi avoids Radio Frequency (RF) which generates harmful radiations by Wi-Fi. Li-Fi provides high bandwidth to access internet with the college and the university which are much helpful for students and other peoples who are using internet. The advancement of this technology is to propose a system which controls accident on roads using artificial intelligence. This paper refers a technology which is useful in education sector using visual light communication.

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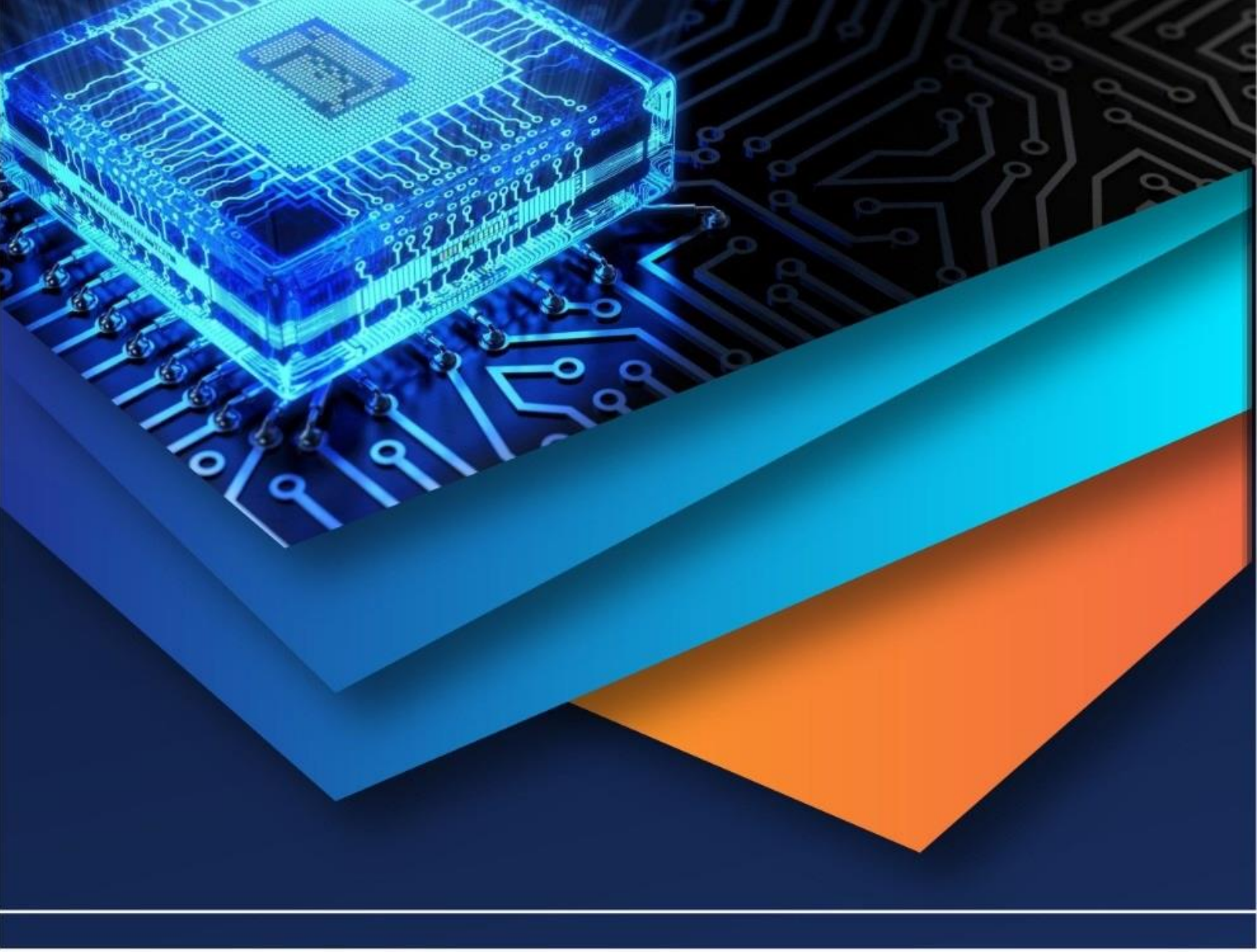

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