

A MEDICAL AUTOMATION SYSTEM USING LI-FI TECHNOLOGY AND ZIGBEE

Rohit Pardeshi ,Parag Sanyashiv , Rohan Kalyankar , Prof. Jaydeep Patil

Computer, AISSMS IOIT Pune (India)

ABSTRACT

The main aspiration of this technology is that to reduce wireless transmission problem in Wi-Fi Technology through LiFi Technology. Li-Fi is inherently the member of visible Light Communication , it uses LED bulbs as hot-spots and it provides huge data performance than Wi-Fi. Li-Fi is supreme for high density wireless data coverage in incarcerated area and for relieving radio interference problems. In this paper ,we are using Li-Fi technology to reduce medical day to day data or message transmission problem in Hospital.

Keywords: *LED, VLC , Zigbee , database, Photo detector etc.*

I. INTRODUCTION

It is the most originate part in life is through exchanging data in to wired or wireless devices. Wi-Fi is the most conversant and adequate technology which is apprised with radio frequencies for data communication .The connection of high sensitivity receivers which gives us broad coverage at less frequencies and line of sight (LOS) communication at high frequencies. Because of increasing in more wireless communications, Wi-Fi is facing many challenges namely capacity, availability, efficiency and security at the time of communication . In this, we are providing good facilities to patients or ward persons in hospital using Li-Fi Technology.

II. LITERATURE SURVEY

Before this above mentioned technology, there was many issues related to wireless transmission protocols. It consist of many issues related limited range, high power consumption, limited bandwidth of transmission of data. Reduces in performance of data transmission process. It can be easily hacked by attacker at the time of worldwide data transmission process. Less security in message transmission was the major problem. But in this Technology it reduces the such errors and improve the performance and give the better secure data transmission in it. It is not more expensive as compare to Wi-Fi technology.

III. SYSTEM DESIGN

In this system , we are using Li-Fi technology and zigbee module to have a proper and secure data transmission in medical application. In this , we are showing how ambulance can send it message data through the Li-Fi technology. One additional part is tolerant distance in it. It will help to detect ambulance is in hospitals area or not. This technology helps to get ready for treatment when ambulance send it the message to the hospital. This technology

also used to analyze the traffic status on the road. It also helps to reduce the traffic problem. To reduce the errors and improves the performance of data transmission process. Ward person will send the data to the led which is fitted in the room already. After that it will communicate with corridors led through zigbee, similarly corridor led will be communicate with main led. Getting the message from corridors led it will send it to the receptionist desktop table. Mobile to mobile communication is also possible in it. It sends the data or message very secure. Proper and good performance in medical application by using the light fidelity technology or optical fiber technology. U-V light communication is also possible in it.

IV. DIAGRAMS

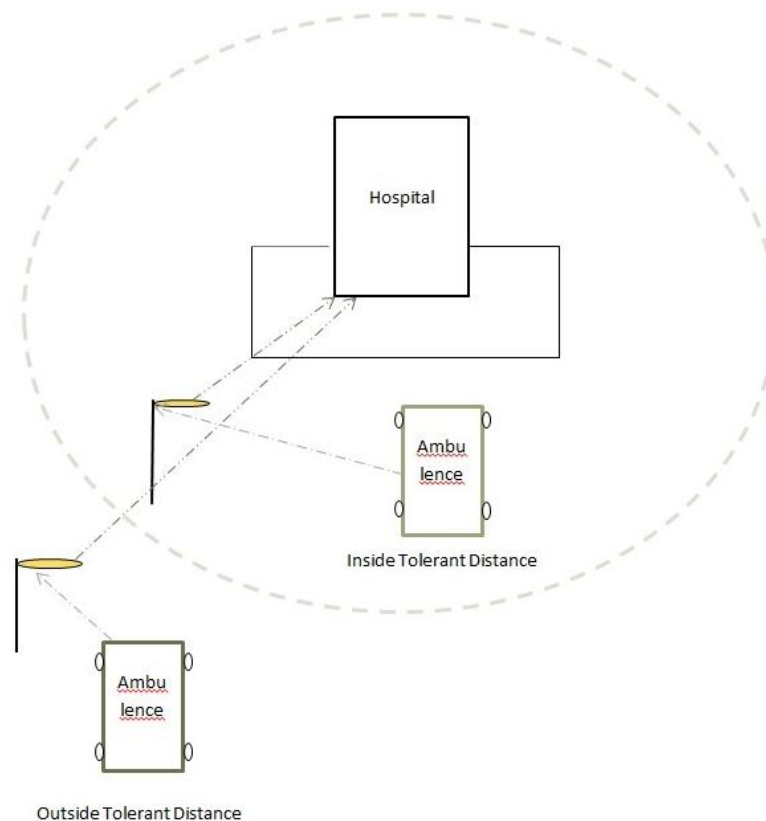


Fig. LED through data transmission



Fig.VLC



Fig . Zigbee

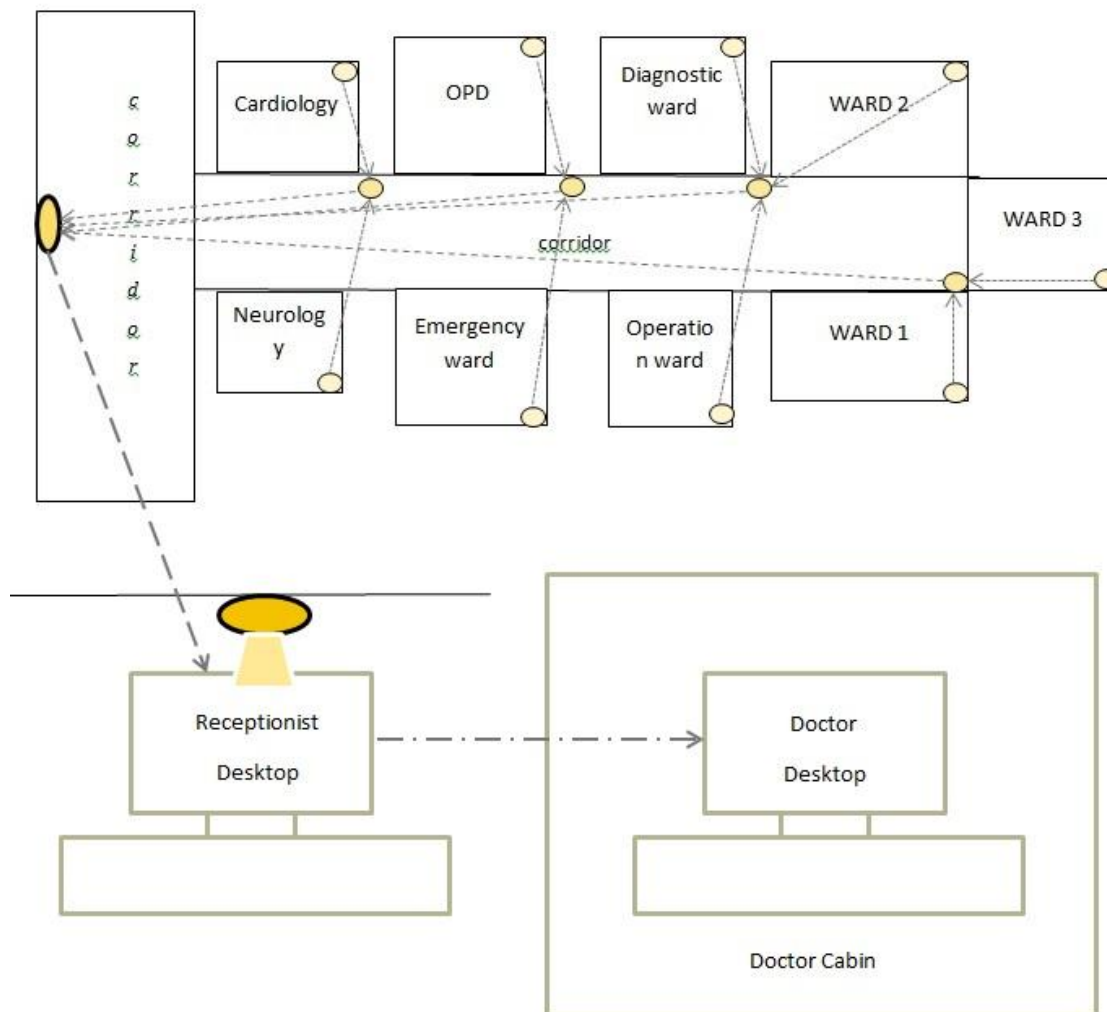


Fig. Data transmission operations

Where ○ - ward rooms led , ● - corridor led , ● - main hub or led

Sensor

VLC

VLC provides the infrastructure for illumination, control and communications and will greatly reduce wiring and energy consumption within a building. It overcomes the problems of communication and facilitates a much higher data rate than Bluetooth or Wi-Fi. It sends data quickly and securely. Uses of VLC in hospitals and healthcare like mobile phones and Wi-Fi's are inconvenient in certain parts of hospitals, especially in MRI scanners and operating theatres.

Zigbee

Zigbee is only used for communication purpose in it. It consist low power consumption , low bandwidth. When ward person communicate with other one then that time zigbee will be used in it. It is reliable , self-healing ,self-configuring network. It takes less battery at the time of communication. Its transmission packets are small in size so it will helpful to easily communicate with each other. It is also more popular in an acknowledge based protocol.

Photo detector

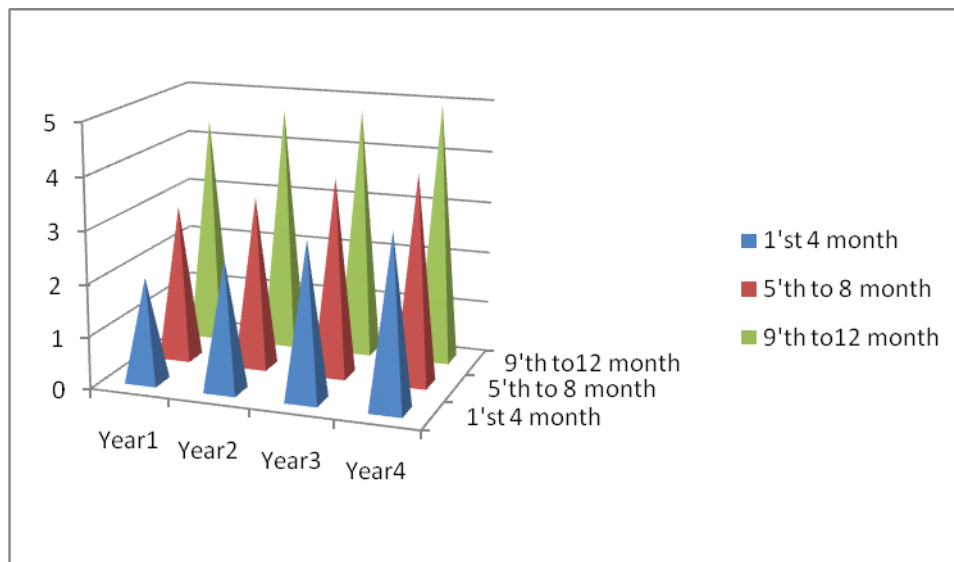
It is a sensor of electromagnetic energy or light. It converts the photons of light in to current. It is being covered by anti-reflecting coating. It is used in led to led data transmission network protocol. It allows its whole properties like photoemission technique, photovoltaic technique, polarization at the time data transmission.

Algorithm

1. Initially ward person/patient will send data to the LED(ward LED).
2. Then ward LED will communicate with corridors LED using Zigbee.
3. Corridors LED will be send the message to the main hub(i.e. main LED).
4. After getting message from Corridor LED hub will send to the receptionist desktop as shown in figure.
5. Receptionist will get the message. It will validate it by persons details message is correct or not.
6. If any message is required related to doctor then it will send it to the doctor otherwise it(message or problem) will manage by receptionist or compounder(like saline bottle empty or other miscellaneous work).

Result

Year wise improvement of the smart system



V. CONCLUSION

It conclude as , this technique is more reliable and helps to communication purpose. It is less expensive smart system. Output of this technique it increases performance of the communication system with the help of Li-Fi technology and Zigbee.

REFERENCES

- [1] Harald Haas, „Wireless data from every light bulb“ , TED Global, EdinBurgh, July 2011.
- [2] “New Epoch of wireless communication: “Light Fidelity” IJIRCCE, vol 1, issue 2, April, 2013
- [3] “LI-FI” the latest technology in wireless” IJCCE, vol2 issue 3, July, 2012.
- [4] seminarprojects.com/s/seminar-report-on-lifi.

- [5] Harald Burchardt, Nikola Serafimovski, DobroslavTsonev, Stefan Videv, and Harald Haas, “VLC: Beyond Point-to-Point Communication,” Communications Magazine, IEEE, 52(7), pp. 98-105, July 2014.
- [6] Xu Bao, Guanding Yu, Jisheng Dai, Xiaorong Zhu, “Li-Fi: Light fidelity-a survey,” Wireless Networks, Springer, pp 1-11, January 2015.
- [7] N.Navyatha, T.M.Prathyusha, V.Roja, M.Mounika, “Li-Fi (Light fidelity)-LED Based Alternative”, International Journal of Scientific & Engineering Research, Volume 4, Issue 5, ISSN 2229-5518, pp. 1039-1042 May 2013.
- [8] Chung Ghiu Lee (February 2011). Visible Light Communication, Advanced Trends in Wireless Communications, Dr.MutamedKhatib (Ed.), ISBN: 978-953-307-183-1, InTech, Available: <http://www.intechopen.com/books/advanced-trends-in-wireless-communications/visible-light-communication>
- [9] Swati Singh, Y.P, “Li Fi- A new Paradigm,” International Journal of Advanced Research in Computer Science and Software Engineering, Volume 4, Issue 2, ISSN: 2277 128X, February 2014.
- [10] Susmit Paul, Sushmita Sharma, “Future of Telecommunication Technologies: Wi-fi vs. Wi-max vs. Li-fi vs. Gi-fi”, ISTP Journal of Research in Electrical and Electronics Engineering, pp. 128-136, 2014.
- [11] C.Periasamy, K.Vimal, D.Surender, “LED Lamp Based Visible Light Communication in Underwater Vehicles,” International Journal of Engineering Trends and Technology (IJETT) – Volume 13, Number 3, pp. 103-106, Jul 2014.
- [12] Rahul R. Sharma, Raunak, AkshaySanganal, “Li-Fi Technology Transmission of data through light”, IJCTA, Vol 5 (1), pp.150-154, Februrary 2014.
- [13] Akshit Aggarwal, DeepaliJhanji, “ COMPARATIVE STUDY : LI-FI V/S WI-FI,” International Journal of Research & Development in Technology and Management Science, Volume - 21 Issue 1, March 2014.
- [14] Kanchan Gupta, Kajal, Ashish Saini, “Light Fidelity Technology- A Review,” International Journal of Research (IJR), Vol-1, Issue-10 pp. 135-139, November 2014.
- [15] “What is Li-Fi” (2014), [Online]. Available: http://purelifi.com/what_is_li-fi/li-fi-features/
- [16] Gomez A. , Kai Shi, Quintana C. , Sato M, Faulkner, Thomsen B.C. , O" Brien D, “Beyond 100-Gb/s Indoor Wide Field-of-View Optical Wireless Communications,” Photonics Technology Letters, IEEE , Volume 27, Issue 4 , pp. 367-370, February 2015