

ADVANCEMENT IN HOME AUTOMATION USING LI-FI TECHNOLOGY: A SURVEY

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Abstract: *We have designed a prototype Li-Fi system which will help to monitor home status as well as provide internet facility to user. Which comes with three module first module consists of sensors such as temperature (LM35), Gas leakage (MQ7), light intensity (LDR) which are connected to the Raspberry Pi. After detecting home status by different sensor it is send to transmitter side Raspberry Pi controller. In second Module Raspberry pi work as router which provide internet access to user and in third module user can control devices like lights and fan manually with the help of android application.*

Keywords: *Li-Fi (Light Fidelity), Raspberry pi, LDR (Light Dependent Resistor), IOT (Internet of Things).*

1. INTRODUCTION

Li-Fi is transmission of information through a LED light that differs in force speedier than the human eye can take after. At the point when exchanged the LED ON, advanced 1 is transmitted and when it's OFF, computerized 0, The system consist of three modules 1St one is for Monitoring the home Status. 2nd one is for Data transmission and 3rd one is for controlling electronics devices manually with the help of android application. There are two side in this framework we use two Raspberry Pi microcontrollers. One is for transmission and other is for receiving purpose. In the 1St Module at the transmission side there are three sensors for sensing Temperature, gas leakage and light intensity. In the 2nd Module data transmission is done with Rj45 cable and Microcontroller work as router. In 3rd Module user can manually operate electronic appliances like Fan, Lights Etc. with android application.

2. LITERATURE SURVEY

Swapnil Gangarde, Ashwini Gadade, Jyoti Pandit, Prof.Soumitra Das [1] proposed system which mainly consists of sensors such as temperature (LM35), Gas leakage (MQ7), light intensity (LDR) purpose are connected to the Arduino uno Atmega 328. After detecting home status by different sensor, it is send to transmitter side arduino controller. Tx Arduino send all such data to the receiver side arduino using Li-Fi TX and Rx. On the basis of measured value get by receiver side arduino on or off of light or fan is possible. When temperature goes above threshold value then buzzer will on to indicate temperature getting high that will prove the chance of fire detection. When light intensity goes low then automatically light will on and when smoke gas leakage detects then exhaust fan is on help to remove leaked gas.

Siddhi Narvekar, Sukanya Sathe, Sayli Pawar, Shruti Mhapsekar [2] proposed Li-Fi system which transfer text message between two PC's. The project is to establish the communication between any two PC's using a simple system in which led is use for transmitting data from one side and the photodiode from other receiving side with the communication protocol using visible light.

Prof. Prajakta Jadhav, Shazia Khatib, Kaisahemd Maner [3] proposed system which is working on optical wireless communication. This module should effectively be able to send out data from one device to another using LED's.The transmitter section consist of the data input which is fed into the raspberry pi via the Wi-Fi system which is inbuilt in the raspberry pi-3. The input data is nothing but the instructions that are built into the android application. the raspberry pi controls the quick movements of the interfaced LEDs according to the instructions given into it with the help of the Li-Fi transmitter circuit. At the receiving end the quick movements of the LEDs is detected by the photo diode on the receiving circuit of the Li-Fi. This modulated data is then fed into the microcontroller. The controller then controls the gestures of the interfaced motor with the help of motor driver according to the given instructions.

Himani Singh Dhami, Nidhi Chandra, Nishank Srivastava, Avanish Pandey [4] proposed that the User Interface of the application (Web or Android) allows the user to communicate with the Raspberry Pi with the help of internet.The end user gives the instruction of turning ON/OFF the specific gadget by pressing the ON/OFF button in the application. The application combines via the internet to communicate the code to the raspberry-pi. Raspberry reads the instruction and sends the signal to the respected SSH via GPIO.Yhe

Respected relay handleand turns the device ON/OFF.The user can easily interact with the android smartphone. The end user can send instructions using an android application.

Prof. Prashant Rathod, Syed Khizaruddin, Rashmi Kotian, Shubham Lal [5] proposed that system focuses on controlling the Electronic Devices with Smartphone. It also focused on Live Monitoring System to get the fresh updates of what exactly the power consumption of a Room or a Hall is happening The system will be based on some few Sensors, Detectors which will be implant with the Raspberry-Pi.There will be a Server where the updates will be stored in Database by using Android, Web Application or Website. The website will be contents Login System and UI can be custom by the user as per the need with Gadget adding the feature.

3. GENERAL DISCUSSION AND REVIEW COMMENTS

Sr No.	Paper Title & Author Name	Advantages	Disadvantages
1	Swapnil Gangarde, Ashwini Gadade, Jyoti Pandit, Prof. Soumitra Das “Application of Li-Fi in Wireless Sensor Network”	The proposed system is scalable, flexible and low of cost than the commercially available home automation systems.	System only provides home automation using Li-Fi.
2	Siddhi Narvekar, Sukanya Sathe, Sayli Pawar, Shruti Mhapsekar “Light Fidelity (Li-Fi) a Prototype Li-Fi System To Transfer Data Through Wireless Communication”	Wherever there is a light source, there can be Internet. meaning that high-speed data transmission could be available everywhere.	Internet cannot be used without a light source. This could limit the locations and situations in which Li-Fi could be used.
3	Prof. Prajakta Jadhav, Shazia Khatib, Kaisahemd Maner “Data Transmission Through Li-Fi”	In the proposed system data transmission is done with the Li-Fi Technology.	The major disadvantage of this technology is that light cannot pass through obstacles. Therefore it cannot pass through walls and many such objects and can be blocked easily.
4	Himani Singh Dhama, Nidhi Chandra, Nishank Srivastava, Avanish Pandey “Raspberry Pi Home Automation Using Android Application”	This proposed system consists of Raspberry pi for transmission of data through wifi. And this system provide the internet for accessing & controlling the status of appliances in home using	Strengt and dynamics of future standards and protocols is the main drawback.

		mobile application.	
5	Prof. Prashant Rathod, et.al. "Raspberry Pi Based Home Automation Using Wi-Fi, IOT & Android For Live Monitoring"	The major focus of this project is to provide the Ease of Access to handicapped people.	This system is dependent on internet and the Wi-Fi range. Once the raspberry pi is disconnected or taken out of the Wi-Fi coverage website access is stopped.

Table No. 1(GENERAL DISCUSSION AND REVIEW COMMENTS)

4. OUTCOME OF LITERATURE SURVEY

The proposed IOT system, which incorporates Li-Fi module where we using two Raspberry Pi 3 Model B, one for transmission and other for receiving data. The system made the wireless transmission of the meter data possible. The transmitted data were received by the Photo Diode which further circulate to microcontroller which provide internet facility for controlling home appliances and help user to check current status of home condition i.e temperature, gas leakage, and intensity of light which is also done manually with android application. On earlier proposed system , their was use of lifi technology for data transfer but not provide internet facility. In our propose system we are providing Internet connection with the lifi technology to the user.

5. CONCLUSION & FUTURE SCOPE

The proposed WSN system, which incorporates Li-Fi module in a Raspberry Pi 3 Model B, has been successfully implemented. The use of the Li-Fi module made the wireless communication of the meter data possible. The transmitted data were received by the Server LiFi and controlling of home appliances is done by checking current status of home condition i. e temperature, gas leakage, and intensity of light. Acknowledgement We would like to showcase our gratitude and deep appreciations from our heart to all of them who helped us including our parents, mentor, friends etc.Further we would like to express special thanks to our Director Dr.Eknath Khedkar, Head of Department, and our project guide Prof. Soumitra Das & project coordinator Ms. Monika Dangore for their valuable support, guidance and encouragement along with stimulating our inner talent to write the survey paper.

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