Data Transmission through Light

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Abstract

Li-Fi technology provides transmission of data through illumination with accuracy and security. Li-Fi means Light-Fidelity. To send a data through a Fluorescent Light here Manchester coding is used and it is done on microcontroller. The lightening of fluorescent lamp is cause of current running through it. When amplitude and current of arc is suitable for lamp, it glow up and here we have novel technique, fluorescent lamp is used as medium for transmit information. The user at receiver will receive information through photodiode. Here we designed an economical circuit for fluorescent lamp with cheap price. In reference of Wi-Fi, It is great for general wireless coverage within buildings, whereas Li-Fi will be ideal for high density wireless data coverage in confined area and for reliving radio interference issues. This project will be useful in areas where necessity of data transfer is accurate and fast. Li-Fi giving more features than W-Fi and it cheap and in every case it is preferable, i.e. accuracy, delay, efficiency, speed. Li-Fi is applicable in all where internet is used or confidentiality needed. For some special cases, fiber optic cable is unable to reach destinations viz. in petroleum or chemical plants.

Keywords: Electronic Ballast, Fluorescent lamp, Computer, Li-Fi

I. INTRODUCTION

The transfer of information from one place to a different is one among the foremost vital daily activities. This wireless networks that connect North American country to the net square measure terribly slow once multiple devices square measure connected. Because the range of devices that access the net will increase, the fastened information measure out there makes it a lot of of devices to get pleasure from high knowledge transfer rates and connect with a secure network [1]. But, radio wave’s square measure simply a little a part of the spectrum out there for knowledge transfer. An answer to the current downside is by the employment of Li-Fi system [1]. it’s transmission of information through illumination by taking the fiber out of fiber optics by causation data through Associate in Nursing Fluorescent lightweight that varies in intensity quicker than the human eye will follow. It’s the term some have accustomed label the quick and low-cost wireless communication system, that is that the optical version of Wi-Fi [2]. It uses light rather than rate radio wave for knowledge transfer In our work, Li-Fi technology will play a significant role in relieving the serious masses that this wireless systems face since it adds a brand new and unutilized information measure of light to the presently out there radio waves for knowledge transfer. So it offers a lot of larger band (300 THz) compared thereto out there in RF communications (300GHz). Also, a lot of knowledge coming back through the spectrum might facilitate alleviate issues that the magnetic attraction waves that escort Wi-Fi might adversely have an effect on our health. We have a tendency to measure developing a basic system of information transmission for the long run wherever data for laptops, good phones, and tablets are transmitted through the sunshine during a space. Security wouldn't be a problem as a result of if you can’t see the sunshine, you can’t access the info. As a result, it are often utilized in high security military areas wherever RF communication is susceptible to overhang dropping. It’s supported light Communication (VLC) [1]. VLC may be a digital communication medium that uses light between four hundred rate (780 nm) and 800 rate (375 nm) as optical carrier for knowledge transmission and illumination. It uses quick pulses of sunshine to transmit data wirelessly. The most elements of the system square measure as follows:

1) A high brightness lamp (FL) that acts as transmission supply.
2) A chemical semiconducting material photodiode with sensible response to light because the receiving element. FL are often switched on and off to come up with digital strings of various combination of 1s and 0s. To come up with a brand new knowledge stream, knowledge are often encoded within the lightweight by varied the flicker rate of the Florida. The Florida are often used as a sender or supply, by modulating the Florida lightweight with the info signal. The Florida output seems constant to the human eye by virtue of the quick a flicker rate of the Florida. Communication rate larger than one hundred Mbps is feasible by victimization high speed Florida with the assistance of assorted multiplexing techniques. VLC rate are often increased by parallel knowledge transmission victimization Associate in nursing array of Florida wherever every Florida transmits a distinct knowledge stream. The overall summary of the whole project additionally mentioned during this section. Section two discusses concerning the literature survey for the event of this
project. Everything associated with the project and existing system square measure delineated during this chapter. Section three code demand specifications is employed for code demand, system options, non-functional demand, different demand and analysis model is mentioned during this chapter. Section four System style is targeted on the system design UML diagrams and photo of the project. Section five Conclusion contains the benefits and application of the project.

II. LITERATURE SURVEY

A literature review may be a crucial and an appraising outline of the themes, problems and arguments of a selected clearly outlined analysis topic obtained from the printed (and unpublished) literature. The literature survey is study of existing systems as mentioned below.

The present Methodology was incontestable at the 2011 by cluster of corporations and industries group to push high speed optical wireless system and overcome the radio based mostly wireless spectrum. Consistent with the li-fi syndicate [2], it’s doable to realize quite ten Gbps of speed, on paper which might enable a high definition film to download simply in thirty second. Researchers at the University of Strathclyde [2] in European country have begun the task of delivery high-speed. The technology was incontestable at the 2012 shopper natural philosophy show in Las-Vegas [2] to exchange knowledge victimization lightweight of varied intensity given aloof from their the screens, detectable at a distance of up to ten meter. Employing a commonplace white-light junction rectifier man of science at the Heirnrich hertz Institute in berlin [2], Germany, have reached knowledge rates of over five hundred megabytes per second. The present methodology is incontestable at the 2014 by Rahul R. Sharma, Raunak & akshay sanganal [ ] is li-fi technology. This techniques applied to VLC rate multiplied by parallel knowledge transmission victimization AN array of junction rectifier (LED transmits totally different knowledge streams).advantage of this technology is speed > 1Gbps will be achieved and it will supply of net like Wi-Fi. It will replace with Wi-Fi.

III. MOTIVATION

Security becomes important in day to day life as rapid growth in internet. Similarly as light is easily available, one can use light for protection of data in communication. Therefore by using Li-Fi technology system is going to be developed which is useful in areas where data interchange and security is important. Li-Fi technology is used for keeping data confidential, fast way transmission. Using Li-Fi, it is possible to keep data secured than Wi-Fi as it is impossible to hack data by attacker as well as data will received only by the owner or authenticated person. Li –Fi technology uses Fluorescent Light which is easily available everywhere. Thus, in working of “technology” no need to create Hotspot like Wi-Fi for security assurance. Therefore it becomes effective with cost and time required for data transmission and reception.

– Objectives: Problem Statement: To develop a Li-Fi Technology.

IV. EXPLORED SYSTEM

A. Hardware Requirements:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>LI-Fi router</td>
<td>1. Clock frequency 1.2 GHZ/or above</td>
</tr>
<tr>
<td></td>
<td>2. Range- 150 meters/or above</td>
</tr>
<tr>
<td>Processor</td>
<td>Pentium 4(2.14 GHZ)/or above</td>
</tr>
<tr>
<td>RAM</td>
<td>512 MB</td>
</tr>
<tr>
<td>Operating System</td>
<td>Any platform (JRE)</td>
</tr>
</tbody>
</table>

B. Software Requirements:

<table>
<thead>
<tr>
<th>Design tool</th>
<th>Software</th>
<th>Minimum</th>
<th>Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development tool</td>
<td>Visual Studio 08/10</td>
<td>Star UML</td>
<td>2000e</td>
</tr>
<tr>
<td>Development kit</td>
<td>ARDUINO IDE 1.5</td>
<td>Windows-XP</td>
<td>Windows-XP</td>
</tr>
<tr>
<td>Development platform</td>
<td>Any platform</td>
<td>Windows-XP</td>
<td>Windows-XP</td>
</tr>
</tbody>
</table>

The basic perspective of this method is that to transmit the information through fluorescent light-weight (FL). During this operating, If the Sunshine State is on, then transmit digital worth resulted as one and if it's off, then transmit worth resulted as zero. The Sunshine State is switched on & off terribly quickly, which supplies higher opportunities for sending information. The information transmission is Line of sides. Origin: High speed secured information transmission. It’s recently technique and it is replaced for Wi-Fi. For planned system, we have a tendency to commit to have new style for our system to attach the transmitter.
circuit to every different through a server laptop. This will be setup within the structure of recent buildings. Then, the information transmitted by the fluorescent lamps cannot be static, and every lamp will have information controlled by the server or network, that interfaces to the microcontroller of the transmission circuit. It’s attainable for a controller within the main room to transport a series totally different messages for various locations by vocation different functions within the main program embedded within the microcontroller. All the knowledge, which is distributed out by the lamp at every location, is ready within the main program. As is seen, there square measure several applications for this method in numerous fields. Its application areas will vary from laptop games to industrial producing, urban facilities, and manage usage. In our work, Li-Fi technology will play a serious role in relieving the significant hundreds that the present wireless systems face since it adds a brand new and unutilized information measure of visible radiation to the presently obtainable radio waves for information transfer. So it offers abundant larger waveband (300 THz) compared thereto obtainable in RF communications (300GHz). Also, a lot of information returning through the spectrum may facilitate alleviate issues that the magnetism waves that go along with Wi-Fi may adversely have an effect on our health. We have a tendency to square measure developing a basic system of information transmission for the long run wherever data for laptops, sensible phones, and tablets are transmitted through the sunshine during a space. Security wouldn't be a difficulty as a result of if you can’t see the sunshine, you can’t access the information. As a result, it is utilized in high security military areas wherever RF communication is liable to eavesdropping. It’s supported visible radiation Communication (VLC). VLC could be a digital communication medium, which uses visible radiation between four hundred rate (780 nm) and 800 rate (375 nm) as optical carrier for information transmission and illumination. It uses quick pulses of sunshine to transmit data wirelessly.

Fig. 1: Data Flow Diagram

V. EXPERIMENTAL RESULTS

A. Input Set:
ASCII formatted data is the input provided to this system. Following figure shows the snapshot of input screen.
B. Result Set:
We saw ordered flow of knowledge in numerous states and users of system. Manchester cryptography primarily based information Transmission through lightweight relies on Fluorescent lightweight (FL) or alternative source of illumination for the transfer of knowledge. The transfer of the information is often with the assistance of every kind of sunshine, in spite of the part of the spectrum that they belong. That is, the sunshine will belong to the invisible, ultraviolet or the visible a part of the spectrum. Also, the speed of the communication is over enough for downloading movies, games, music and every one in terribly less time.

VI. CONCLUSION

Here, developed system that connects the transmitter circuit to every alternative through a server pc. This will be setup within the structure of latest buildings. Then, the info transmitted by the fluorescent lamps can now not be static, and every lamp will have information controlled by the server or network, that interfaces to the microcontroller of the transmission circuit. It’s attainable for a controller within the main room to channelize series totally different messages for various locations by career different functions within the main program embedded within the microcontroller. All the knowledge, which is distributed out by the lamp at every location, is ready within the main program. As may be seen, there square measure several applications for this technique in varied fields. Its application areas will vary from pc games to industrial producing, urban facilities, and unit usage.

REFERENCES