Li-Fi Technology

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Project Aim

Data Transmission Between PC's Using Li-Fi technology

Project description:

- The role of communication in day to day life is very important. Communication can be of two types which are wireless or wired. Basically, wireless communication is mostly preferred over wired.
- In this project, we present a new mode of communication between 2 laptops or PC's using visible light or Li-Fi technology.
- Li-Fi, or "Light fidelity", refers to wireless communication systems using light from light-emitting diodes as a medium instead of traditional radio frequencies, as in technology using the trademark Wi-Fi.
- Li-Fi is expected to be ten times cheaper than Wi-Fi.
- Li-Fi has the advantage of being able to be used in electromagnetic sensitive areas such as in aircraft and nuclear power plants without causing interference.
- The light waves cannot penetrate walls which makes a much shorter range, though more secure from hacking, relative to Wi-Fi.

Hardware Used:

- Arduino Uno R3 or Compatible Circuit
- LED Driver Transistor
- High Brightness LED Array or Lamp
- LED Receiver (LDR) with Op Amp Circuit
- Power Supply

Software Used:

- Arduino IDE
- Serial Terminal Software like X-CTU or Teraterm

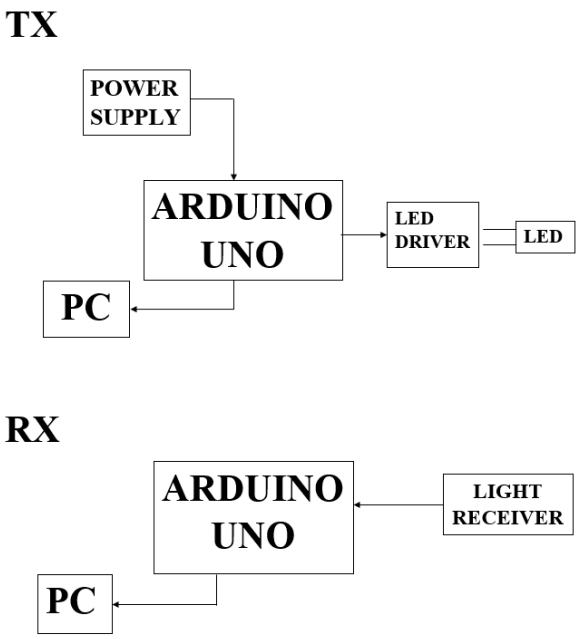

Figure 1: The device

Approach

1. The hardware in this project consists of two sections; transmitter and receiver.
2. The data can be sent to microcontroller through pc by using software called hyper terminal or X-CTU, which is used for serial communication.
3. The microcontroller after receiving the data it forwards the data to a LED Driver which drives the LED source.
4. The data is converted into light signals using LED's and multiple bits of data is sent by switching the LED off or on.
5. At the receiver end, a light sensor receives light signals (on/off) and the output is filtered and amplified using op amp which is connected to the receiver microcontroller.
6. This microcontroller then serially transfers the data to the laptop or pc which is then displayed on the screen in the serial terminal software used at the transmitter section.