



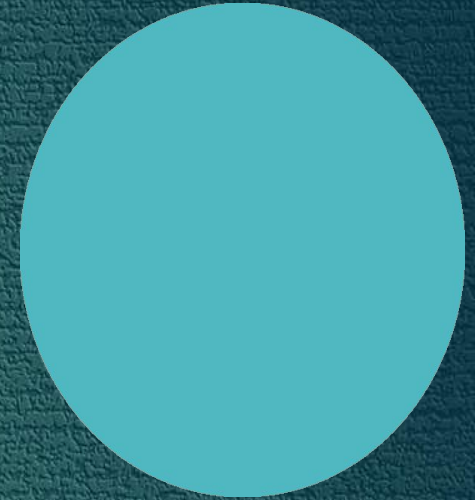
LI-FI TECHNOLOG Y

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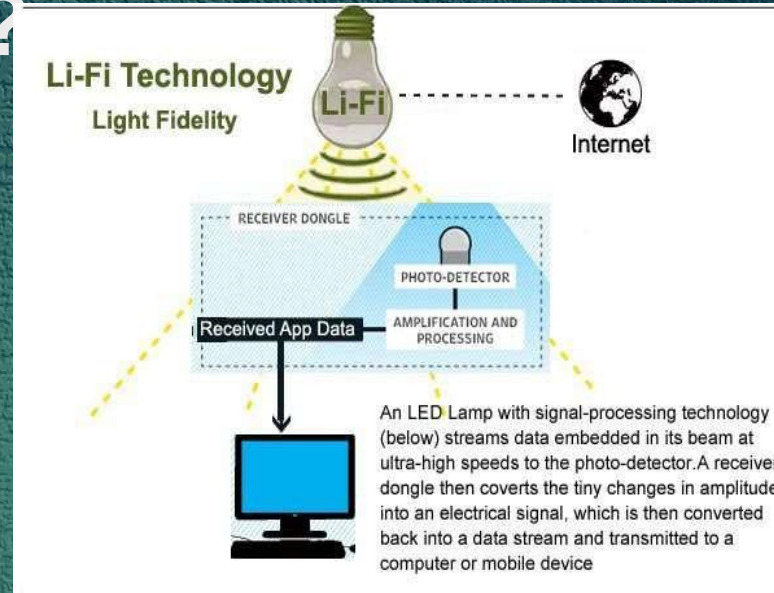
- ❖ Introduction to LI-FI
- ❖ History of LI-FI
- ❖ Implementation of LI-FI
- ❖ How it works
- ❖ LI-FI vs WI-FI
- ❖ Application
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- ❖ Conclusions



WHAT IS LI-FI....??

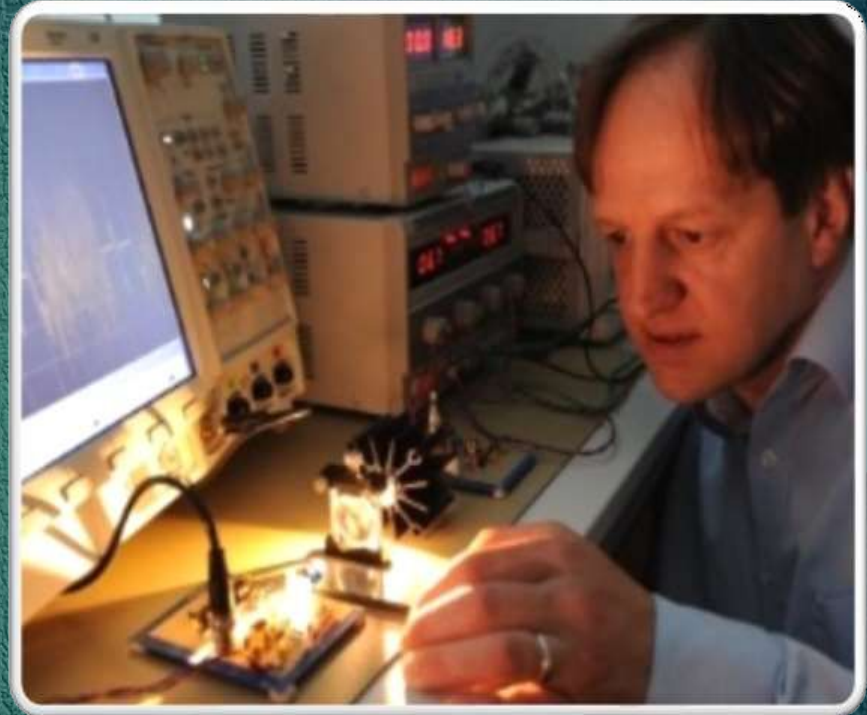
- ❖ LIFI –"LIGHT FIDEALITY" is transmission of data through illumination, i.e. sending data through a LED light bulb that varies in intensity faster than human eye can follow.
- ❖ Li-Fi is a light based Wi-Fi it uses light instead of radio waves to transmit information.

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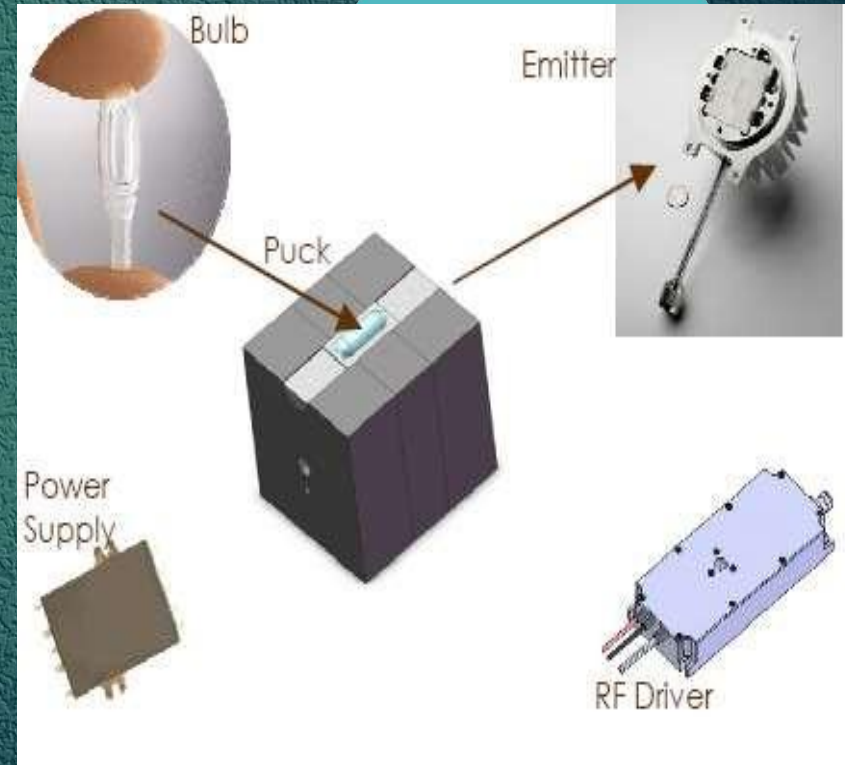
HISTORY

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- ❖ The technology truly began during the year 1990's in countries like Germany, Korea and Japan where they discovered LEDs could be retrofitted to send information. Prof. Harald Hass from University of Edinburgh continues to wow the world with the potential to use light for communication
- ❖ He demonstrated in year 2012.



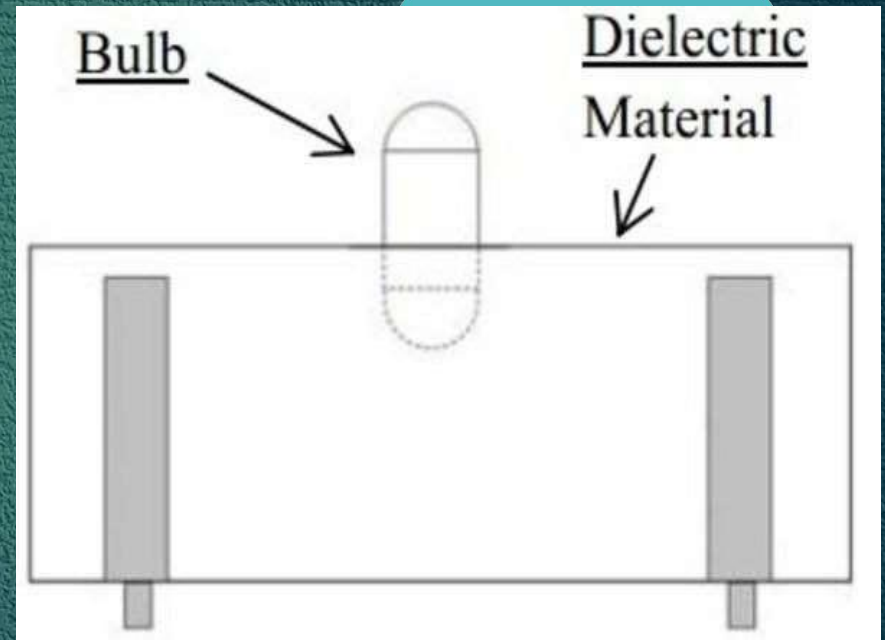
IMPLEMENTATION OF LI-FI

- ❖ The LI-FI product consists of three primary sub assemblies
 - Emitter
 - RF Driver
 - Power Supply



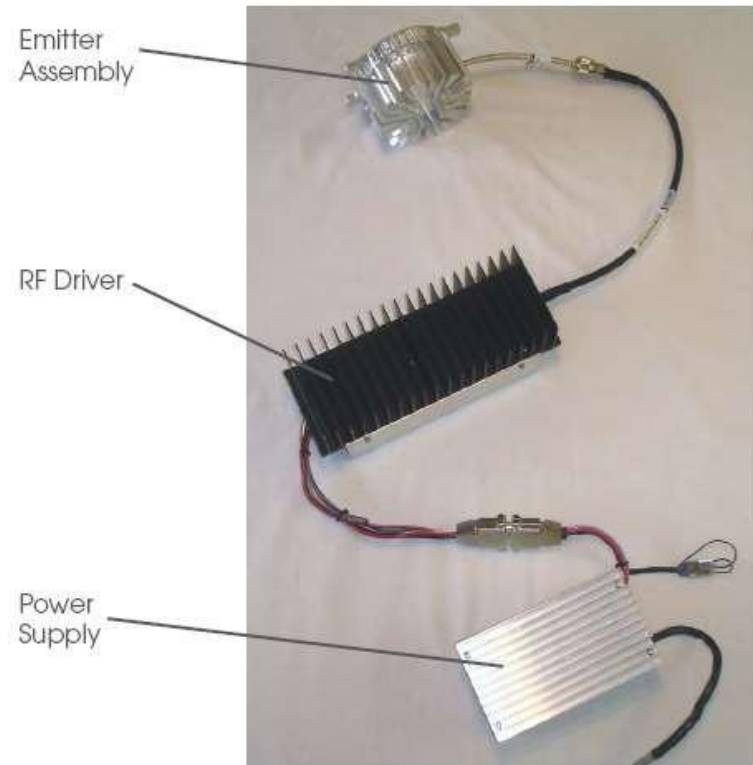
FUNCTION OF BULB ASSEMBLY -

- ❖ At the heart of LI-FI is the bulb sub assembly where a sealed bulb is embedded in a dielectric material
- ❖ The dielectric material serves two purposes
 - A. Wave guide
 - B. Electric field



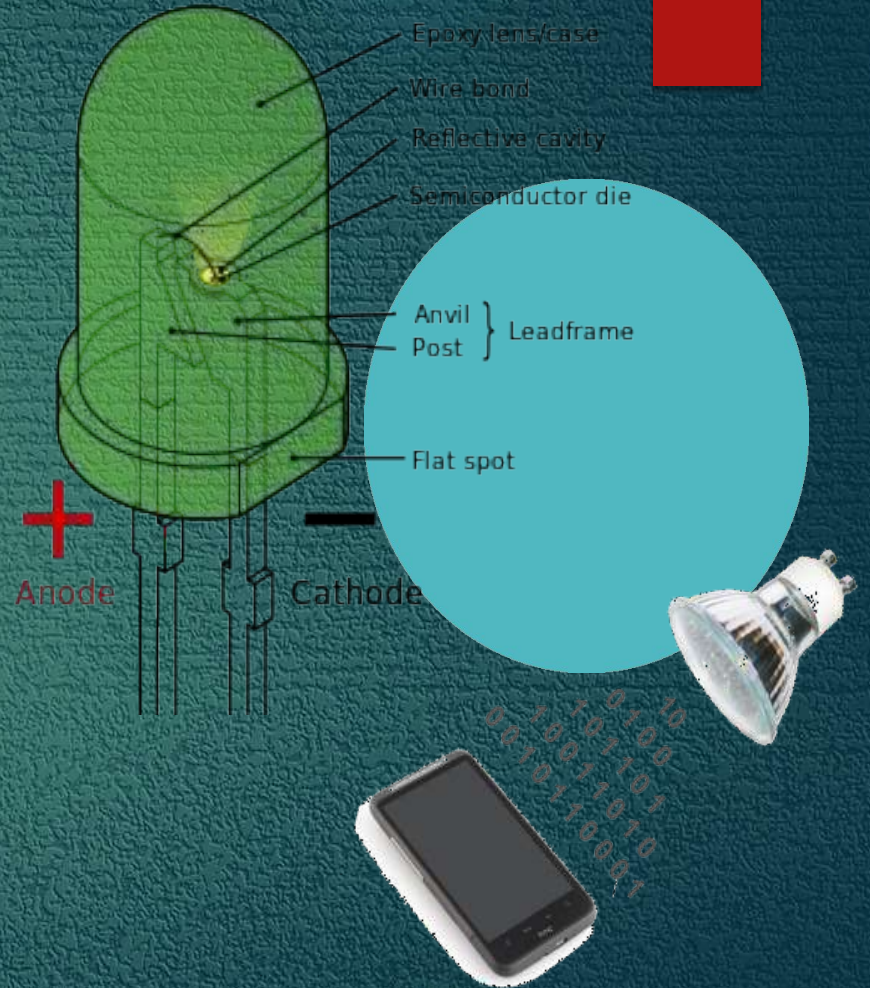
RF DRIVER

- ❖ Power amplifier (PA) assembly that uses an LDMOS device.
- ❖ Converts electrical energy into RF power.
- ❖ The PA is designed to ruggedness and efficiency.
- ❖ The RF driver also contains controls circuit for digital and analog lighting controls.



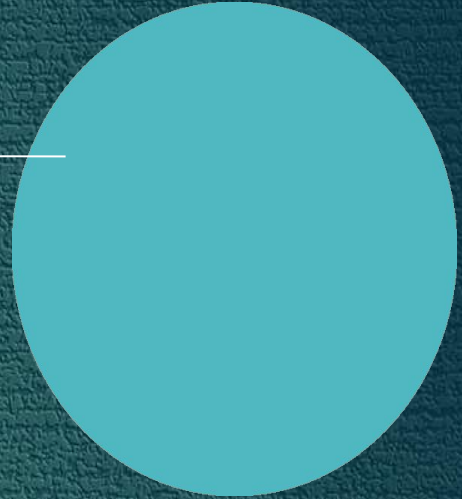
HOW LI-FI WORKS-

- ❖ Operational procedure is very simple, if the LED is on, you transmit a digit 1, if its off you transmit a digit 0.
- ❖ the LED's can be switched on and off quickly, which gives nice opportunities for transmitting data. hence all that us required is some LEDS and a controller that code data into those LEDs.
- ❖ We have to just vary the rate at which the LEDs flicker depending upon the data we want to encode.
- ❖ Thus every light source will work as a hub for data transmission.



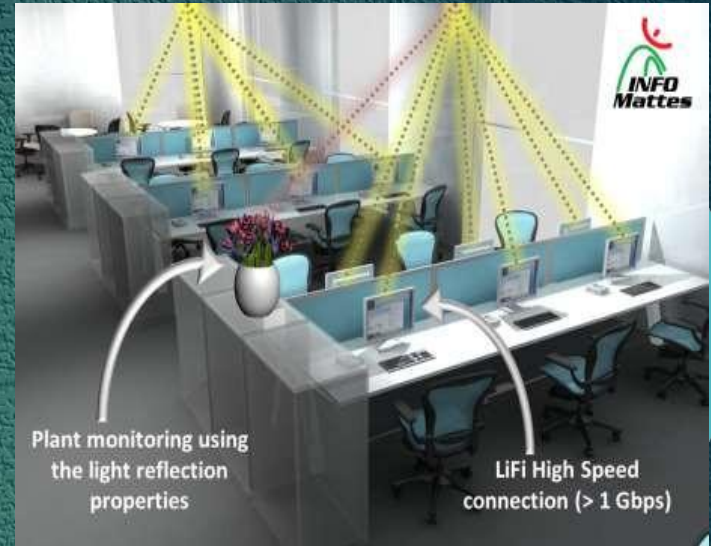
LIFI/WIFI COMPARISON

PARAMETER	LI-F	WIFI
1. Speed	High	High
2. Range	Low	Medium
3. Data density	High	Low
4. Security	High	Medium
5. Transmit/receive power	High	Medium
6. Device-to-device connectivity	High	High
7. Reliability	Medium	Medium
8. Obstacle Interference	High	Low



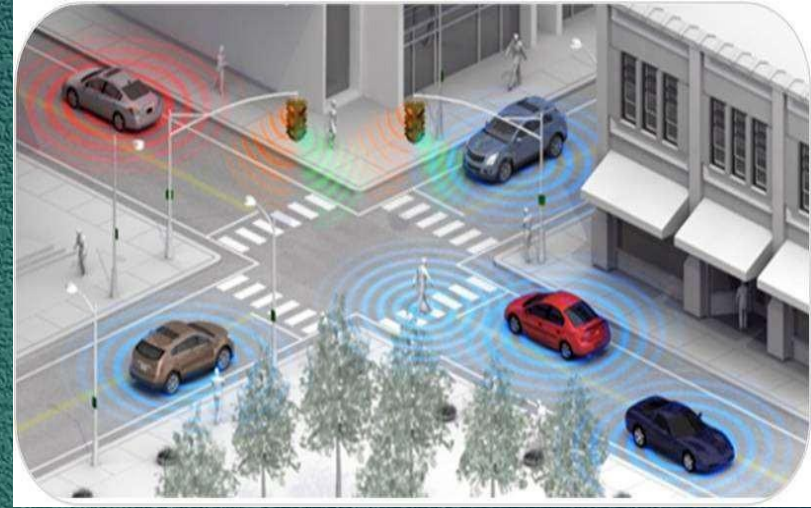
APPLICATIONS

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- ❖ Used for modern medical instruments.
- ❖ In aircrafts, it can be used for data transmission.
- ❖ Used in petroleum or chemical plants where other transmission or frequencies can be hazardous.
- ❖ In traffic signals, Li-Fi can be used which will communicate with the LED lights of the car and number of accidents can be decreased.
- ❖ Location based services:-GPS
- ❖ Underwater communication.
- ❖ RF Spectrum relief.
- ❖ Li-Fi can be used effectively in the places where it is difficult to lay the optical fiber cable.



ADVANTAGES

- ❖ Larger bandwidth.
- ❖ High efficiency.
- ❖ More availability.
- ❖ High security.
- ❖ Thousands and millions of street lamps can be converted to Li-Fi spots.
- ❖ No license needed.
- ❖ Green information technology.
- ❖ Lighting points used as Hotspots.
- ❖ The issues of the shortage of radio frequency bandwidth may be sorted out by Li-Fi.
- ❖ This technology worldwide can be used for every street lamp would be a free data access points.



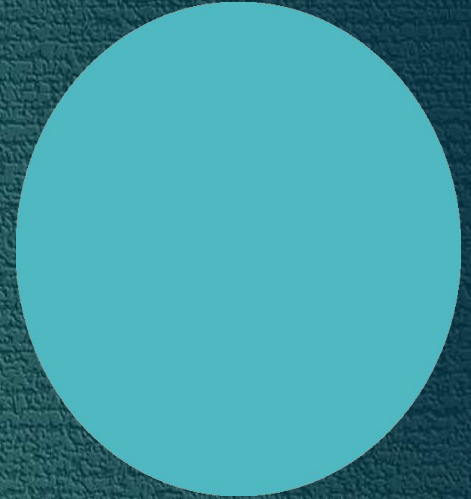
LIMITATIONS

- ❖ Li-Fi doesn't work in the dark .
- ❖ Li-Fi has a big drawback compared to Wi-Fi, unlike Wi-Fi we cannot move to other rooms unless there are wired bulbs too.
- ❖ Light can't pass through the objects.
- ❖ Interference from external sources like sun light, normal bulbs, and opaque materials in the path of transmission will cause interruption in the communication.
- ❖ High installation cost of the VLC systems.
- ❖ A major challenge facing Li-Fi is how the receiving device will transmit back to transmitter.



FUTURE DEVELOPMENTS

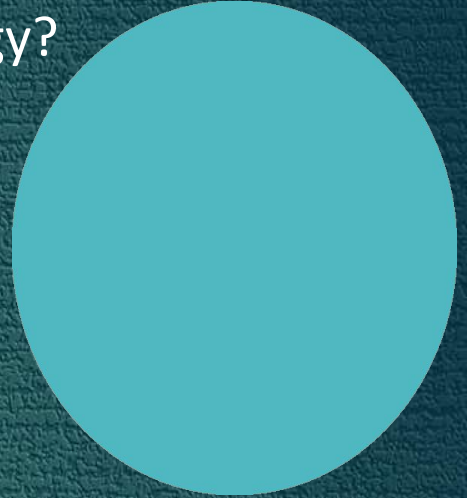
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- ❖ Efficient alternative to radio-based wireless.
- ❖ Li-Fi is an emerging technology which is quick and reliable.
- ❖ Air waves are clogged so let's use light waves.
- ❖ Hence, let's proceed to Li- Fi for a brighter ,cheaper and greener future.



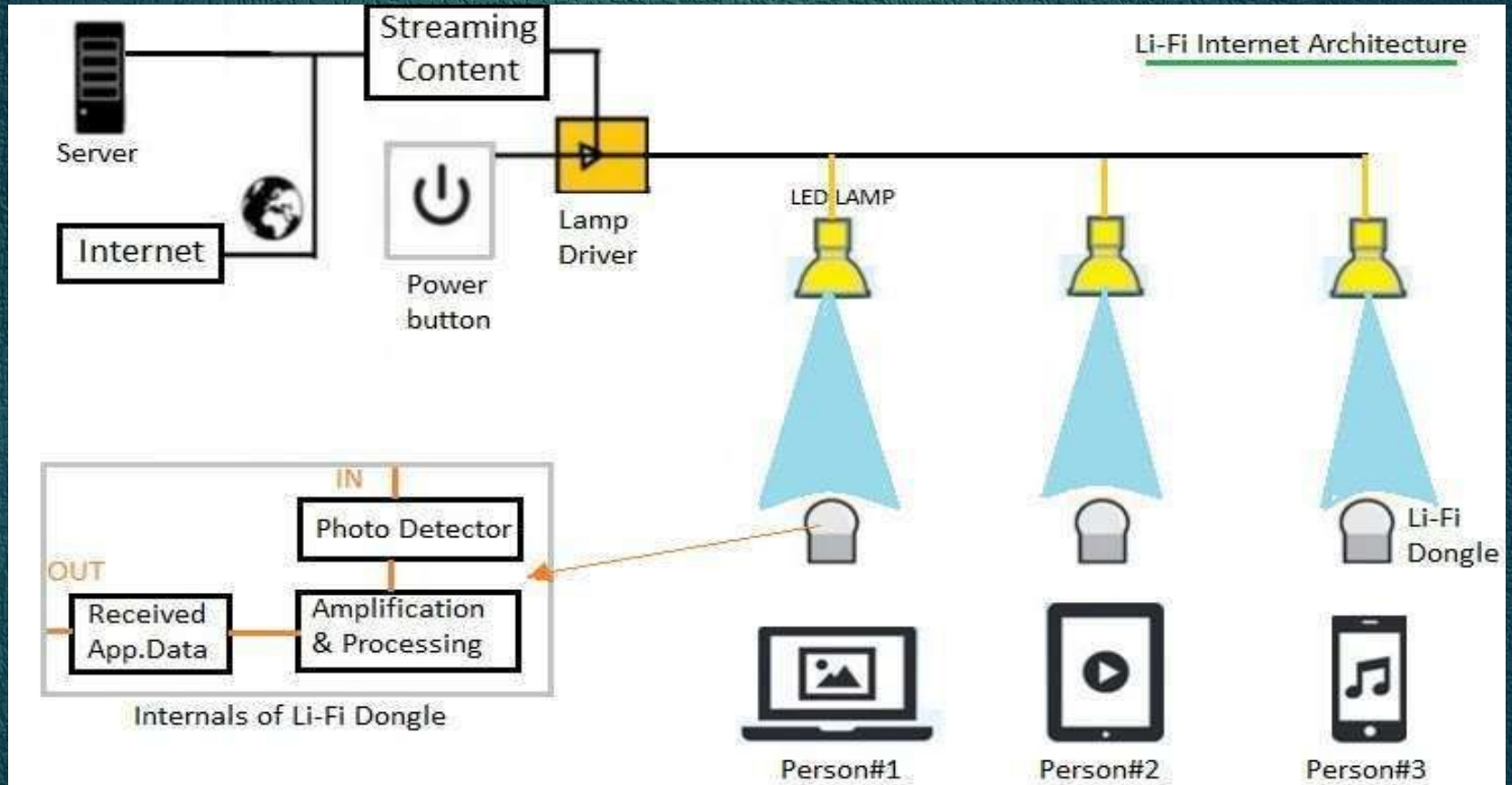
Some Questions

Q1: How the mobiles can receive the connection?

Q2: Can we use the same concept in other technology?

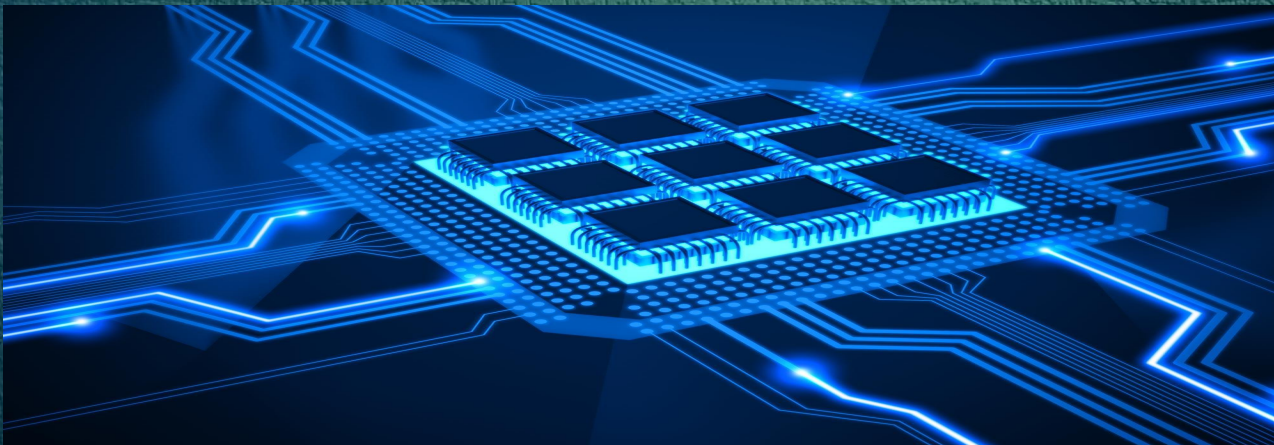


Answer Q1



Answer Q2

Intel has reported progress on making optical neural networks a reality. By using light instead of electrons, these chips could be up to 100 times more power efficient and reduce latency by many orders of magnitude. Intel simulated two ONN architectures and considered scalability and manufacturability, as they described in a recent paper.



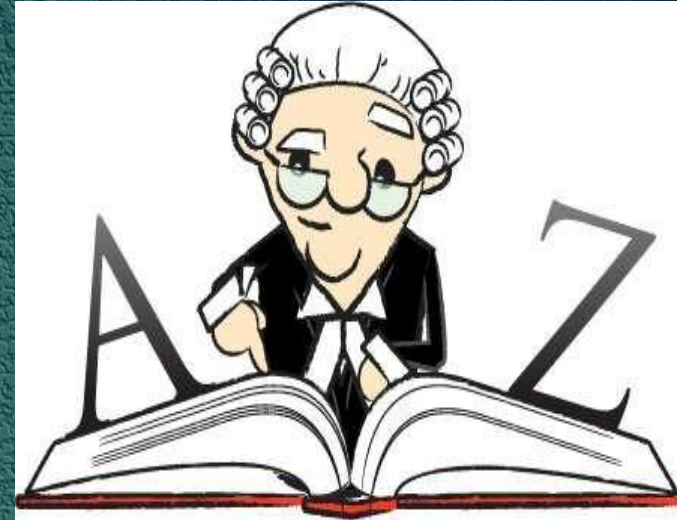
CONCLUSION



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- ❖ Overcomes the limitations of radio spectrum.
- ❖ High speed of 10Gbps can be achieved.
- ❖ The possibilities are numerous and can be explored further.
- ❖ If this technology can be put into practical use, every bulb can be used something like a Wi-Fi hotspot.
- ❖ we will proceed toward the cleaner, greener, safer and brighter future.
- ❖ This may solve issues such as the shortage of radio-frequency bandwidth.
- ❖ Allows internet where traditional radio based wireless isn't allowed such as aircraft or hospitals
- ❖ LI-FI is enabled by advance digital transmission technologies

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**ANY
QUESTIONS-**



**THANK
YOU**

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