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*Тернопільський національний технічний університет імені Івана Пулюя***LI-FI – МАЙБУТНЄ БЕЗПРОВІДНОЇ ПЕРЕДАЧІ ДАНИХ**

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*Ternopil Ivan Pul'uj National Technical University***LI-FI – FUTURE OF WIRELESS DATA SHARING**

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Li-Fi (Light Fidelity) is a bidirectional, high speed and fully networked wireless communication technology similar to Wi-Fi. A new era of wireless communication will soon conquer the world. German physicist Herald Hass and a group of scientists of Edinburg University developed the light (plasmatic) version of wireless communication which they called D-Light or Li-Fi. Their invention is based on the fact that speed of light is faster than radio waves, so speed of data sharing by Li-Fi is faster than by Wi-Fi.

By Li-Fi data are transmitted through LED's (light emitting diodes) which change their intensity faster than human eye can see and that intensity is captured by a detector only. At present estimated transmission of data is around 10GBps. But some British scientists obtained the result of 224Gbps, it's more than 25GBps. The operation of Li-Fi is quite simple, yet amazing. You just need two things, first is LED (which acts as a light source) and the other is photo detector (a light sensor for capturing light). When light source starts to emit light, light sensor on other end will detect it and get a binary 1 otherwise binary 0. LED flashes with some frequency and forms a message. Light sensor detects the light flashing and receives the message. But in our world there is nothing perfect and so Li-Fi isn't perfect at all.

Disadvantages of Li-Fi: It works only if there is a direct line of light between source and receiver. These signals cannot penetrate solid bodies, e.g. walls. So, a person will need a special wired bulb in the room where he or she will connect the network.

Advantages of Li-Fi:

1. It is very secure (nobody can hack it,) since there is no signal penetration through walls.
2. Radio waves are harmful for human beings as they penetrate the body and may cause mutation. But Li-Fi is safe.
3. Tremendous data transfer rates.
4. It works under water, so it is beneficial in many fields. Because of these advantages wireless technology can be used in various environments.

Li-Fi has some applications which Wi-Fi doesn't have:

1. Underwater communications: radio waves cannot be used under water because these waves are strongly absorbed by sea water within their transmission and this fact makes them unusable underwater but Li-Fi is suitable for underwater communication.
2. Health sector: since Wi-Fi is not safe to be used in hospitals and other various health care sectors because it penetrates human body Li-Fi can be introduced in this sector.
3. Internet anywhere: street lamps, light of vehicles can be used to access the Internet anywhere in footpaths, roads, malls, anywhere where light source is available.
4. Safety and management: it can be used to update traffic information almost immediately and it will be easy for traffic police to deal with traffic and catch the one who breaks the rule.