

Some Funny Yet Relevant Title



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Introduction

Introduction here

Adaptive Frequency Hopping

What Is Frequency Hopping?

Adaptive Frequency Hopping (AFH) is a technique where rather than using one single radiofrequency to transfer data, the frequency is constantly changing between a number of channels. This allows for both faster transfer speeds, and makes it harder for intruders to interfere with the signal.

Why Is It Adaptive?

The transmitting device is constantly monitoring the different channels to make an estimate of how good quality they are. For example, if one frequency is currently busy or being jammed, then it will simply use another channel.

Another General Box

Box for another common feature (add more boxes as needed)

Conclusion

Conclusion here

References

idk if we need this

Acknowledgements

Rito

Wi-Fi

Wi-Fi box here

Optical Fibres

Introduction Optical fibres rely on total internal reflection to confine pulses light rays within the core as a method of transmitting binary data. Modern fibre technologies are limited by physical phenomena of light travelling in an optical medium.

Residual Absorption Fundamental vibration frequencies of the particles that make up the glass absorbs light with matching frequencies.

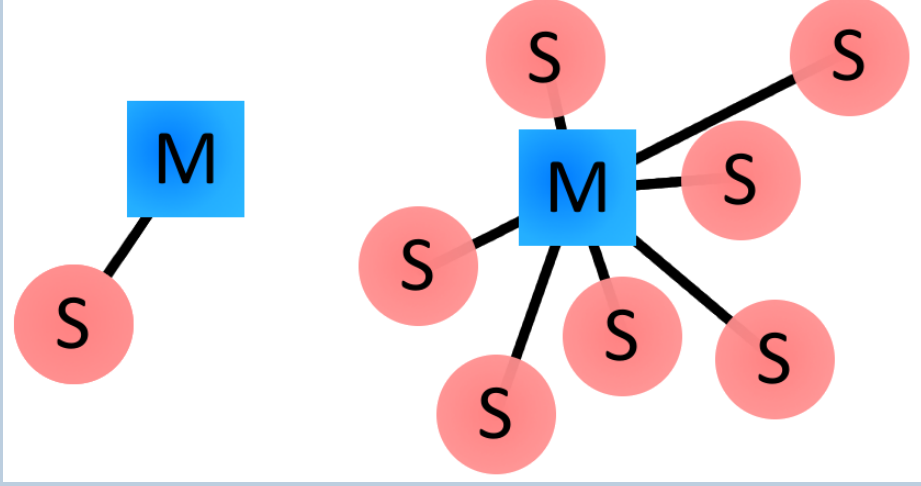
Dispersion Dispersion is an optical phenomenon where light of different frequencies travel at different velocities through an optical medium. In optical communications, data is coded in binary form and transmitted as pulses of light. As a single pulse from the laser carries more than one frequency of light, it is critical that the gap in time at the receiving end is not great than the time period of the wave group, otherwise the original data would be lost. This limits the maximum length of a single optical fibre, and requires the use of repeaters and/or amplifier to enable long distance communications, such as the trans-Atlantic cables.

Rayleigh Scattering An atom or molecule reradiates incident light in any direction except the incident direction. This effect is magnified at shorter wavelengths, and is increased by imperfections in the composition of the silica glass on a molecular level.

Bluetooth

History Bluetooth was developed by the Swedish telephone company Ericsson AB in 1990

Master/Slave Topology Bluetooth follows a master/slave topology where there is a master device broadcasting data to a maximum of seven slave devices. This network of 8 devices is known as a piconet. The master will always default to being the device which initialised the connection, however master and slave roles can be exchanged given that both devices agree upon this.



AFH Bluetooth uses a technique known as AFH, which is explained on the left side of this poster.

Li-Fi

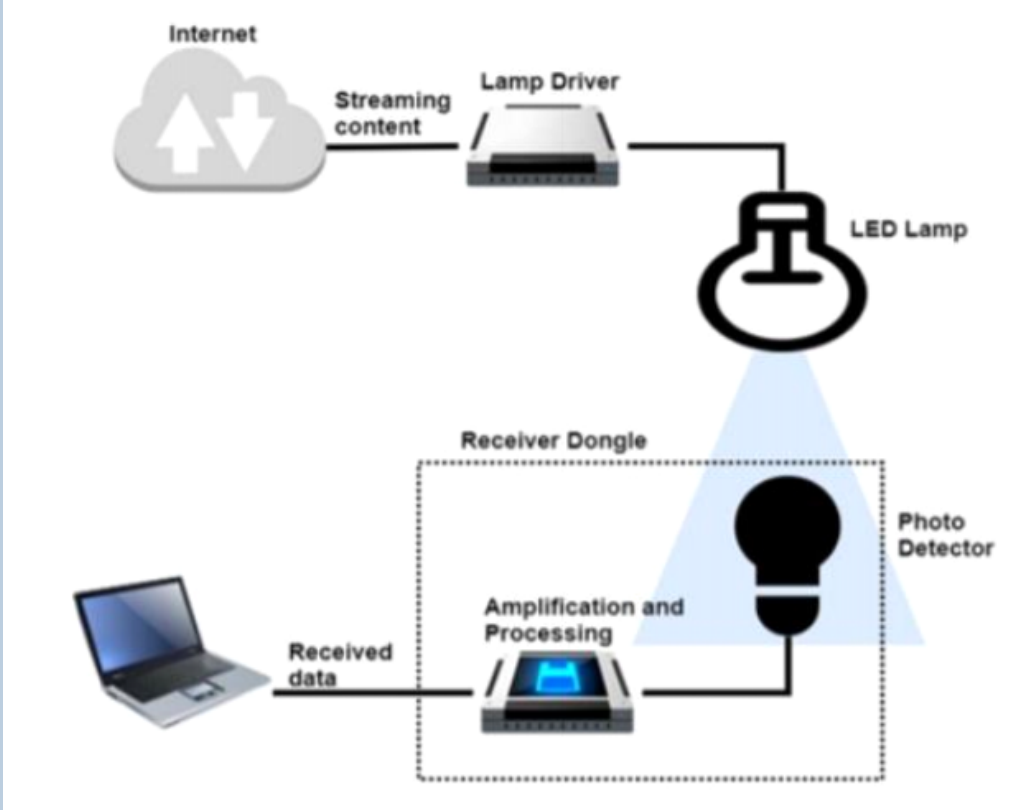
Principle A light emitter, a photo detector; Modulate light intensity faster than eyes can follow; Receiver dongle converts changes electrical signals; Signals converted back into a data stream and transferred to a mobile device.

Advantages

1. faster, safer and more efficient and diverse transmission of data 2. Bandwidth of visible spectrum is 10,000 times more than that of radio spectrum 3. Implementation and maintenance costs are minimal compared to Wi-Fi. 4. Elimination of health problems 5. Enabling of Internet of Things on a large scale

Challenges

1. Light can't pass through object 2. Interference of other light sources can cause interruption in communication. 3. Communication is limited to point-to-point transfer when implemented at very high frequencies.



Near Field Communication

How It Works Near Field Communication (NFC) works off of small chips enabling data transfer between devices, of which there are active and passive ones. Active NFC devices are powered by an external source, and are able to both send and receive data. Passive devices can only send data, but do not require a power source of any kind. In close proximity with one another, the electromagnetic field of the active device will induce a small current in the passive one.

Stats

Max Range = 20cm, Max Speed = 424kbit/s, Transmission Frequency = 13.56MHz

Advantages

Power Efficiency. The passive devices do not require a power source, only active ones do.

Control. Since the range is small, users will mostly be aware and be able to determine when exactly information transfer occurs.

Convenience. NFC does not require any prior setup or pairing to use, unlike bluetooth or wifi. Data