ABSTRACT

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TOPIC:

Performance analysis of visible light communication for white-light modulation schemes

In recent years, the advent in the manufacturing technology of Light Emitting Diodes (LEDs) has resulted in LEDs with improved efficiency and correspondingly Visible Light Communication (VLC) has revolutionized the technological industry. Because of its wide bandwidth range and super-fast data transmission, VLC has already emerged as an advanced means for wireless communication. VLC works on the principle of modulating the intensity of LEDs, converting the information into optical form and transmitting in the visible light spectrum. The transmitter propagates visible light by rapid flickering of the LEDs indistinguishable to human eye. The transmitted information in the form of modulated intensity is captured by a photodiode at the receiver side. The converted electrical signal is then decoded to recover the transmitted data. With saturation in the Radio Frequency (RF) spectrum, research is being done on making VLC a more efficient and faster alternative to RF based wireless systems especially in indoor areas where spectrum is already clustered. Several white-light modulation schemes are in use for data transmission at high rate. The purpose of this research paper is to implement and analyze the performance of different modulation techniques such as on-off keying, variable pulse position modulation, pulse amplitude modulation etc. for a line-of-sight VLC channel. The aim of this paper is to produce a comparison between the different modulation techniques on the basis of performance. By testing the impact of these techniques on different parameters of a VLC system such as data rate, power of transmitted signal, transmission distance, bandwidth etc., we can not only implement VLC systems using LEDs in a number of applications but also enhance and improve the existing systems based on VLC. The simulations will be carried out in Optisystem â€“ a powerful software design tool to test and develop optical links.