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Comparison of different modulation techniques in a VLC environment

Luke McShine

University of Wollongong in Dubai, UAE

To reduce the spectral load on radio cell systems solid-state light-emitting diodes (LED) has been used as a potential means for a dual communications role, lighting and communication. The visible light transmitted from the LEDs can reduce use of mobile data without interfering with radio frequency transceivers. This visible light system (VLC) can send data through different modulation techniques to the intensity of the light. However, there are few mathematical and analysis framework for the different modulation techniques. Most of previous work used experimental results to compare the different modulation techniques for VLC. This research work provides detailed investigation of the different modulation techniques that can be used for a VLC system. The system bit error rate (BER), bandwidth and data rates will be compared for the different modulation techniques used. The transmitter of the VLC system can implement different modulation techniques hence it can be used in a wide variety of applications depending on the needs of data rate or the bandwidth. Three different modulation techniques will be compared, 4-ASK modulation with digital filtering, color shift keying (CSK), and pulse position modulation (PPM). The channel will be estimated as additive white Gaussian noise (AWGN). The results show that the bit error rate results strongly depends on the type of modulation scheme used, the sampling rate, and the light intensity.

Biography

Luke McShine is in the final year of his Bachelor's Degree in Computer Engineering at the University of Wollongong. His professional memberships include the following but not limited to; Institute of Electrical and Electronics Engineers (IEEE), and Engineers Australia.

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