Design and Development of Light Communication Systems Using Modulation Techniques

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R. Ragumadhavan ; D. Sateesh Kumar ; L.N. Charyulu Rompicharla ; Shiv Ashish Dhondiya ; Seeniappan. Kaliappan ; L. Natrayan **All Authors**

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Abstract:
This research study demonstrates the viability of adopting the planned IEEE 802.15.7 standard as a foundation for the creation of low-to-medium data rate VLC applications in the commercial sector. The proof-of-concept shown here combines software and hardware pieces to provide a versatile platform where new features may be introduced without much programming. It can be concluded that a VLC system's dual functionality requirement is readily met by adhering to the IEEE 802.15.7 standard standards. Using a commercial or specialty lighting microcontroller, the software define part of the approach provided here may be adapted to meet the low cost criterion imposed on commercial VLC LED luminaries. Many examples of grea
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Contents

I. Introduction

The limited data rate of transmission is the primary limitation of RF systems in the bandwidth-intensive field of communications. All other modes of expression follow the same rule. Modulation methods and other communications advancements have led to substantial increases in data transfer rates. MIMO-OFDM approaches, which also use spatial diversity to improve reliability, are the same. The MIMO-OFDM modulation technology is extensively investigated in this paper. Work on improving the efficiency of Visible Light Communication (VLC) systems using MIMO-OFDM is given in this paper. MIMO, OFDM, and MIMOOFDM system channel modelling is also discussed. The data and statistics, together with the results of certain simulations run using regular BPSK, QPSK, and OFDM codes, are supplied. The effectiveness of BPSK and QPSK modulations in terms of BER at various SNR levels has also been examined. Since silicon technology developed and in-depth research in the material sciences were done, more efficient devices for various forms of communication were available [1]–[5], as the data rate of VLC was insufficient to keep up with rising demands.

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