

PERFORMANCE OF ADAPTIVE OFDM SCHEME FOR BROADBAND POWER LINE COMMUNICATION SYSTEM WITH NEURAL NETWORK BASED CHANNEL PREDICTION

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ABSTRACT

Broadband Power Line Communication (BPLC) is a popular technology that utilizes the existing power line networks for the transmission of information. The power line channel is affected by multipath propagation. The BPLC system performance is degraded due to multipath propagation and the noise in the channel. One of the promising approaches to mitigate the problem is to implement a proper modulation technique. Adaptive OFDM (AOFDM) method can potentially aid to achieve high data rates in Broadband Power Line Communication system. To realize this potential, the transmitter needs accurate Channel State Information (CSI) for the upcoming transmission frame. This paper proposes an Adaptive OFDM scheme with an optimal approach of Exponential Effective SNR Mapping (EESM) on prediction of the BER over all subcarriers. A channel prediction scheme using Neural Network is also presented for OFDM system to select a suitable Modulation and Coding Scheme (MCS) for the BPLC channel realization. The proposed method of Adaptive OFDM enhances the system throughput about 8% and reduces the feedback overhead compared to the conventional schemes in BPLC system. The results show that the proposed adaptive algorithm with neural network channel prediction scheme can achieve a considerable improvement in the processing time over the conventional method.

KEYWORDS: Broadband Power Line Communication (BPLC)