Abstract

In this paper we investigate the bit error rate performance of orthogonal frequency division multiplexing system with channel estimation through least square error (LSE) and minimum mean square error (MMSE) algorithms. In this paper we are implementing the M-ary phase shift keying (M-PSK) and M-ary quadrature amplitude modulation (M-QAM) digital modulation techniques for mapping the signal in OFDM system for bit error rate evaluation with the employment of comb-type pilot symbol-assisted channel estimation algorithm over frequency selective multi-path Rayleigh fading channel. Here the performance of Least Squares method depends on not only on the signal-to-noise ratio (SNR) but also on the pilot ratio. Simulation results show that applying the LSE and MMSE channel estimation algorithm, they produce the best BER performance over the fading channel. We can consider the OFDM system as either a modulation technique or a multiplexing technique. In a single carrier system, a single fade or interferer can cause the entire link to fail, but in a multicarrier system, only a small percentage of the subcarriers will be affected [1]. Here we are using the pilot symbols as a guard band to eliminate the Inter Symbol Interference, and cyclic prefix eliminates the Inter Subcarrier Interference.
Comparative Study of Bit Error Rate with Channel Estimation in OFDM System for M-ary Different Modulation Techniques


Index Terms

Computer Science

Signal Processing

Keywords

Channel estimation, orthogonal frequency division multiplexing (OFDM), least square error (LSE), minimum mean square error (MMSE), pilot symbol, bit error rate (BER).