

Research on Pilot Sequence Design Method of Multiple Input Multiple Output Orthogonal Frequency Division Multiplexing System Based on High Power Joint Criterion

Authors : Linyu Wang, Jiahui Ma, Jianhong Xiang, Hanyu Jiang

Abstract : For the pilot design of the sparse channel estimation model in Multiple Input Multiple Output Orthogonal Frequency Division Multiplexing (MIMO-OFDM) systems, the observation matrix constructed according to the matrix cross-correlation criterion, total correlation criterion and other optimization criteria are not optimal, resulting in inaccurate channel estimation and high bit error rate at the receiver. This paper proposes a pilot design method combining high-power sum and high-power variance criteria, which can more accurately estimate the channel. First, the pilot insertion position is designed according to the high-power variance criterion under the condition of equal power. Then, according to the high power sum criterion, the pilot power allocation is converted into a cone programming problem, and the power allocation is carried out. Finally, the optimal pilot is determined by calculating the weighted sum of the high power sum and the high power variance. Compared with the traditional pilot frequency, under the same conditions, the constructed MIMO-OFDM system uses the optimal pilot frequency for channel estimation, and the communication bit error rate performance obtains a gain of 6~7dB.

Keywords : MIMO-OFDM, pilot optimization, compressed sensing, channel estimation

Conference Title : ICICCP 2023 : International Conference on Intelligent Computer Communication and Processing

Conference Location : Istanbul, Türkiye

Conference Dates : April 24-25, 2023