Abstract

Adaptive communication has gained attentions of almost all future communication systems, especially Orthogonal Frequency Division Multiplexing (OFDM) Systems. Adaptive nature pays in terms of rate and power while satisfying certain criteria. In fact, this is a constrained optimization problem. In this paper a similar constrained optimization problem is focused.
Adaptive coding and modulation for OFDM systems using Product Codes and Fuzzy Rule Base System

Adaptive modulation has been a key approach in adaptive systems while consideration of practical channel coding is a recent approach. Moreover, convolution codes and parallel concatenated codes (turbo codes) have been very much worked out for such systems while the serially concatenated codes (Product codes) are mostly neglected due their high decoding complexity. In this paper, we have chosen Product codes with a low decoding complexity decoder named Modified Iterative Decoding Algorithm (MIDA) as adaptive coding scheme and Quadrature Amplitude Modulation (QAM) as adaptive modulation. We propose a new scheme to adapt both code rate and modulation size by solving a non-convex optimization problem using a Fuzzy Rule Base System (FRBS) to enhance the achievable data rate in an OFDM system with a fixed target bit error rate and fixed transmit power for each subcarrier. Proposed scheme is compared with various well known adaptive modulation and coding (AMC) schemes.

References


Index Terms
Adaptive Coding and Modulation for OFDM Systems using Product Codes and Fuzzy Rule Base System

Keywords

OFDM  FRBS  Adaptive Modulation and Coding
   Modulation Code Pair

Product Codes

MIDA

BER