MLP/BP-based soft DFEs with bit-interleaved TCM for distorted 16-QAM signal recovery in severe ISI channels

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Abstract

In this work, we base on multi-layered perceptron neural networks with backpropagation algorithm (MLP/BP) to construct soft decision feedback equalizers (DFEs). The proposal is used to recover distorted 16-point quadrature amplitude modulation (16-QAM) signal. For better performance, error control codes (ECC) are applied to enhance the accuracy of the transmitted data. From the simulations, we note that the MLP/BP-based soft DFEs with bit-interleaved TCM can recover severe distorted 16-QAM data as well as suppress intersymbol interference (ISI) and background additive white Gaussian noise (AWGN). As compared with the LMS DFE, the proposed scheme can provide better bit-error-rate (BER) and packet-error-rate (PER) performance.

Keyword：Artificial neural networks, Decision feedback equalizers, Decoding, Distortion, MIMO