Abstract

In this work, a channel estimation technique based on Artificial Neural Networks (ANN) has been proposed as an alternative to pilot based channel estimation technique for Space-Time Block Coded Multiple-Input Multiple-Output (STBC- MIMO) systems over Rayleigh fading channels. ANNs, due to their high degree of adaptability, can be used for modelling the nonlinear phenomenon of channel estimation and for decoding the degraded symbols over severely faded channel. Two different ANN structures, namely Multilayer Perceptron (MLP) and Recurrent Neural Networks (RNN) have been trained and tested extensively for estimating the channel in STBC- MIMO systems with Binary Phase Shift Keying (BPSK) modulation scheme. Simulated results in terms of Bit Error Rates (BER) vs. Signal to Noise Ratio (SNR) have been used to compare the effectiveness of the learning capability of the two ANN structures over wireless fading channel. RNN structures are found to outperform the MLP, both in terms of training performance and BER results and thus proving its nonlinear dynamic adaptive behaviour.

References
Channel Estimation Technique for STBC coded MIMO System with Multiple ANN Blocks


Index Terms

Computer Science
Communication System
Keywords

STBC  Rayleigh Channel  MLP  RNN  BER