Blind channel estimation and data recovery in DS spread spectrum systems

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Abstract

Recently, a new approach to the problem of data detection for communications over band-limited channels with unknown channel-impulse response is proposed (Vaidis and Weber, IEEE Trans. Commun. 46 (February 1998) 232). This approach utilizes the Viterbi algorithm (VA) for maximum-likelihood sequence estimation (MLSE) in a block adaptive technique for simultaneous channel and data estimation. In this paper, a novel computationally efficient modified VA is developed for MLSE in direct sequence (DS) spread spectrum system. The new modified VA is employed in the approach of Vaidis and Weber (1998) for recovering DS spread spectrum signals in the presence of channel distortion and additive Gaussian noise. The simulation results show that the approach of Vaidis and Weber (1998) implemented with the new modified VA achieves lower probability of error and higher speed of convergence.

Author Keywords: Viterbi algorithm; MLSE; Blind channel estimation; DS spread spectrum systems

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