



Research Article



Resource Allocation Based on Channel State Information in OFDM Systems

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ABSTRACT

Orthogonal Frequency-Division Multiplexing is a modulation scheme specifically designed to

facilitate high-speed data transmission over frequency-selective fading channels. Resource allocation based on channel state information is known to be a very powerful method for improving the spectral efficiency of orthogonal frequency-division multiplexing systems. In case of static channels, the optimal resource allocation for multiuser orthogonal frequency-division multiplexing systems has been investigated. For time-varying channel, the error in channel state information due to channel variation is recognized as the main obstacle for achieving the full potential of resource allocation. Finally, a maximum likelihood receiver for Multiband Keying signals is studied, where multiband keying is a modulation scheme proposed for ultra-wideband systems. The receiver structure and the associated maximum likelihood decision rule is derived through analysis. A suboptimal algorithm based on a depth-first tree search is introduced to significantly reduce the computational complexity of the receiver.

Keywords: Orthogonal frequency division multiplexing, multiband keying, Resource allocation.

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