

A Forward-Backward Kalman For The Estimation Of Time-Variant Channels In OFDM

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Summary

OFDM combines the advantages of high achievable rates and relatively easy implementation. However, for proper recovery of the input, the OFDM receiver needs accurate channel information. In this paper, we propose an expectation-maximization (EM) algorithm for joint channel and data recovery. The algorithm makes use of the rich structure of the underlying communication problem—a structure induced by the data and channel constraints. These constraints include pilots, the cyclic prefix, and the finite alphabet constraints on the data, and sparsity, finite delay spread, and the statistical properties of the channel (frequency and time correlation). The algorithm boils down to a forward-backward (FB) Kalman filter. We also suggest a suboptimal modification that is able to track the channel and recover the data with no latency.

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