

Convergence and steady-state analysis of the normalized least mean fourth algorithm

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Abstract

The normalized least mean-fourth (NLMF) algorithm is presented in this work and shown to have potentially faster convergence. Unlike the LMF algorithm, the convergence behavior of the NLMF algorithm is independent of the input data correlation statistics. Sufficient conditions for the NLMF algorithm convergence in the mean are obtained and an analysis of the steady-state performance is carried out with a new approach. The latter uses the concept of feedback and bypasses the need for working directly with the weight error covariance matrix. Simulation results obtained in a system identification scenario confirms the theoretical predictions on performance of the NLMF algorithm.