ON THE PERFORMANCE COMPARISON OF GRADIENT–TYPE JOINT PROCESS ESTIMATORS IN ADAPTIVE SIGNAL PROCESSING (MonAmOR7)

Author(s) :

Deniz Gencaga (Bogazici University, Turkey)
Aysin Ertuzun (Bogazici University, Turkey)

Abstract : In adaptive signal processing, joint process estimation plays an important role in various estimation problems. It is well known that a joint process estimator consists of two structures, namely the orthogonalizer and the regression filter. In literature, orthogonalization step is performed either by orthogonal transformations or by linear predictors. While the orthogonal transformations do not preserve entropy; the predictors, such as the lattice, do preserve it. However, the steady–state performance of such linear predictors is not as good as those of the orthogonal transformations. Lattice filters do not perform perfect orthogonalization when they operate as gradient–based adaptive predictors. In this work, adaptive escalator predictor is proposed to be used as the orthogonalizer of the joint process estimator. The proposed method preserves the entropy and achieves perfect orthogonalization at all times. Moreover it has good steady–state performance compared to those structures utilizing gradient adaptive lattice filters.

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