ASYMPTOTICALLY OPTIMAL MAXIMUM−LIKELIHOOD ESTIMATION OF A CLASS OF CHAOTIC SIGNALS USING THE VITERBI ALGORITHM (MonPmPO2)

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Abstract :

Chaotic signals and systems are potentially attractive in many signal processing and communications applications. Maximum likelihood (ML) and Bayesian estimators have been developed for piecewise−linear (PWL) maps, but their computational cost is excessive for practical applications. Several computationally efficient techniques have been proposed for this class of signals, but their performance is usually far from the optimum methods. In this paper, we present an asymptotically optimal estimator based on the Viterbi algorithm for detecting and estimating chaotic signals observed in additive white Gaussian noise. Computer simulations demonstrate that the performance of this estimator is similar to that of optimum methods with only a fraction of their computational cost.

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