Fahmy, M. F.; **El-Raheem, G. M. A.**; **El-Sallam, A. A.**
Signal separation using second- and high-order statistics. (English) ❘Zbl 1037.94514❘

Summary: This paper presents two methods for signal separation. In either method, the fundamental criterion for separation relies on reducing to zero, or at least minimizing, the output cross-correlation or cross-cumulant functions of a decoupling multi-input-multi-output system that is fed with mixed signals. In one of the approaches used, the parameters of this system are determined through solving – in a least-squares sense – a linearized set of equations describing the deviations from zero of either the cross-correlation or cross-cumulant functions when evaluated for different lags. An alternative rapidly convergent adaptive algorithm is also described for minimizing the cross-correlation or cross-cumulant functions. The paper also considers both FIR and IIR representations of the decoupling system. It shows that using IIR functions in the decoupling system does not offer any merit over the FIR case. Illustrative examples are given to show the performance of the proposed algorithms.

MSC:

94A12   Signal theory (characterization, reconstruction, filtering, etc.)

Keywords:

deconvolution; signal separation; high-order statistics

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