BLIND SOURCE SEPARATION OF NOISY MIXTURES USING A SEMI−PARAMETRIC APPROACH WITH APPLICATION TO HEAVY−TAILED SIGNALS (TueAmPO2)

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Abstract :

In this paper, we propose a new semi−parametric approach for blind source separation (BSS) of noisy mixtures with application to heavy−tailed signals. The semi−parametric statistical principle is used to formulate the BSS problem as a maximum likelihood (ML) estimation. More precisely, this approach consists of combining the logspline model for sources density approximation with a stochastic version of the EM algorithm for mixing matrix estimation. The proposed method is truly blind to the particular underlying distribution of the mixed signals and performs simultaneously the estimation of the unknown probability density functions (pdf) of the source signals and the estimation of the mixing matrix. The application of logspline density approximation also enables the algorithm to be robust to modelization errors of the sources. In addition, it is robust against outliers and impulsive effect.
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Abstract : (cont.)

Computer simulations are provided to illustrate the effectiveness of the proposed separation method comparatively with classical ones.