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Performance Analysis of Fast Independent Component Extraction

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A novel extension of Independent Component Analysis for blind extraction/separation of one or several sources from time-varying mixtures is proposed. The Signals of Interest in mixtures are assumed to be dynamic, i.e., they are moving, while the other sources are static. The extension version of popular FastICA algorithm is analysed. The algorithms are derived within a unified framework so that they are applicable in the real-valued as well as complex-valued domains, and jointly to several mixtures, similarly to Independent Vector Analysis. Performance analysis of the one-unit algorithm is provided; it shows its asymptotic efficiency under the given mixing and statistical models. Numerical simulations confirm the validity of the analysis, and show the usefulness of the algorithms in separation of moving sources.

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