ICA IN SIGNALS WITH MULTIPLICATIVE NOISE USING FOURTH–ORDER STATISTIC (MonAmOR5)

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✶ Abstract :

An extension of Independent Component Analysis (ICA) to the situation when the mixture of signals is contaminated by multiplicative noise is proposed in this paper. The ICA methods search for the most independent output after a linear transformation of the data vector. If the ICA model is followed by these data, the result of this search is the inverse of the unknown mixture. On the other hand, if there is multiplicative noise the model is not followed and the previous search does not obtain the wanted matrix. However, when the inverse of the mixture is applied to the noisy data, the output possesses a specific statistical structure that can be used to solve the problem. This paper exploits this structure up to fourth order in the statistic to design a method that is able to find the mixture in presence of multiplicative noise, improving greatly the results of the standard ICA methods in this situation, without any limitation in the nature of the sources or the noise.

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