SPATIOTEMPORAL BLIND SOURCE SEPARATION USING DOUBLE−SIDED APPROXIMATE JOINT DIAGONALIZATION (MonAmOR5)

Author(s) :

Fabian Joachim Theis (University of Regensburg, Germany)
Peter Gruber (University of Regensburg, Germany)
Ingo Keck (University of Regensburg, Germany)
Anke Meyer−Baese (Florida State University, United States)
Elmar Wolfgang Lang (University of Regensburg, Germany)

Abstract :

In independent component analysis (ICA) the common task is to achieve either spatial or temporal independence by linearly mapping into a feature space. If the data possesses both spatial and temporal structures such as a sequence of images or 3d−scans taken at fixed time intervals, we can require the transformed data to be as independent as possible in both domains. First introduced by Stone using a joint entropy energy function, spatiotemporal ICA is a promising method for real−world data analysis. We propose a novel algorithm for performing spatiotemporal ICA by jointly diagonalizing various source conditions such as higher−order cumulants of the mixtures, both in time and in space. Similar to algebraic ICA algorithms, this provides a robust method for data analysis, which is confirmed by simulations.

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