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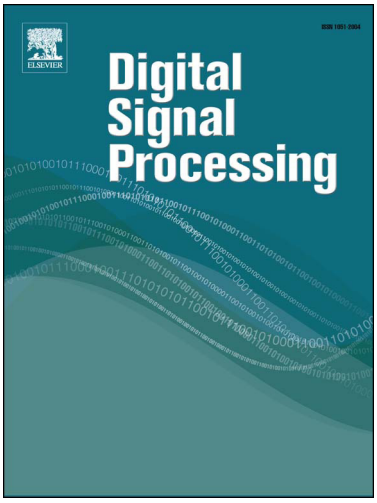

Multisensor Time-Frequency Signal Processing: A tutorial review with illustrations of performance enhancement in selected application areas

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Robust Multisensor Time-Frequency Signal Processing: A tutorial review with illustrations of performance enhancement in selected application areas

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Abstract

This paper presents high-resolution multisensor time-frequency distributions (MTFDs) and their applications to the analysis of multichannel non-stationary signals. The approach combines high-resolution time-frequency analysis and array signal processing methods. The improved performance of MTFDs is demonstrated using several applications including source localization based on direction of arrival (DOA) estimation and automated component separation (ACS) of non-stationary sources, with focus on blind source separation. The MTFD approach is further illustrated by two applications to EEG signals. One specifically uses ACS and DOA estimation methods for artifacts removal and source localization. Another uses MTFDs for cross-channel causality analysis. Data and code are provided to allow readers to reproduce the results presented, and apply these methods to their own data [1].

Keywords: High-resolution TFDs, Multisensor TFDs, Direction of arrival, Blind source separation, Lead field matrix, Non-stationary array processing, EEG abnormality source localization, Time-frequency analysis

Contents

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