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**Practical Approach for Blind Source Separation of Instantaneous Mixture of Audio Signals**

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This paper introduces the blind source separation (BSS) of instantaneous mixtures of unknown signals, especially audio signals. The blind source separation problem is to extract the underlying source signals from a set of non-linear mixtures, where the mixing matrix is unknown. This situation is common in acoustics and Electro Magnetic signal processing as well as image processing. BSS deals with the problem of separating unknown mixed signals from the different sources without the aid of the information about the mixing process. Thus BSS separates a set of particular signals from the set of other signals, such that the regularity of each resulting signal is maximized while minimizing the regularity between the signals, so that the statistical independence is maximized. Blind deconvolution and separation of linearly mixed sources is an important and challenging task for numerous applications such as removing additive noise from signals and images, separation of crosstalk in telecommunication, improving hearing aids techniques and separation of brainwaves for various purposes.

We consider a problem of instantaneous blind source separation of audio mixtures, where a pair of microphones records mixtures of sound sources that are convolved with the impulse response between each source and sensor.

Based on the assumptions of linear mixing process, the mixing matrix was determined through a process of calibration of sensor devices with frequency and directivity.

By multiplying the Inverse of the mixing matrix with sensor output, the original signals are expected to be separated. Generation of mixing coefficients when parameters are given, sampling the recorded signals and un-mixing process are performed in an environment developed in MATLAB.

*Keywords:* Blind Source Separation, Instantaneous Mixing, Statistical Independence, Acoustics, Frequency response