

Source Dependency Modelling in Frequency Domain Source Separation

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Independent vector analysis (IVA) is an attractive computationally efficient solution to mitigate the permutation problem of frequency domain blind source separation and is derived by adopting a multivariate score function, derived from a multivariate source prior, to retain the dependency within each source vector while removing the dependency between different source vectors. To further improve performance we propose a new multivariate source prior to better describe the inter-frequency dependency. Moreover, it is shown that the dependency structure within frequency domain speech signals can be described by a t copula. Then a multivariate student's t distribution, which is constructed by a t copula with univariate student's t marginal distribution, is adopted as the new source prior for the IVA algorithm. The resulting IVA algorithm with this proposed source prior is tested with real speech mixtures in different environments and also by using real room recordings. The experimental results confirm the advantage of the proposed source prior in terms of objective separation performance evaluation.