Identifiability and Non-Convex Algorithm for Multichannel Blind Deconvolution

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In this talk, we consider the multichannel blind deconvolution problem. We propose deterministic subspace assumption, which is widely used in practice, and give some theoretical results. First of all, we derive tight sufficient condition for identifiability of signal and convolution kernels, which is only violated on a set of Lebesgue measure zero. Then, we present a non-convex regularization algorithm by a lifting method and approximate the rank-one constraint and show that the global minimizer of the proposed non-convex algorithm is rank-one matrix under mild conditions on parameters and noise level. The stability result is also shown under the assumption that the inputs lie in a compact set. Finally, we provide numerical experiments to show that our non-convex model outperforms convex relaxation models, such as nuclear norm minimization and some non-convex methods (alternating minimization method and spectral method).