1125-94-1143 **Justin Romberg*** (`jrom@ece.gatech.edu`), **Kiryung Lee** and **Ning Tian**. *Multichannel Blind Deconvolution: New models, Fast algorithms, and Mathematical Performance Guarantees.*

We consider a classic problem in signal processing. We observe the convolution of a signal unknown source vector with M different channel response vectors; from these observations, our task is to estimate the M responses. Traditionally, this is formulated as a null space approximation problem; given that the channel responses have limited length, we can form a matrix from the observations that is guaranteed to have a null space of dimension 1, and knowledge of this null space immediately reveals the channel responses up to a global constant. When the observations are noisy, there are classical guarantees about the asymptotic consistency of this process, but numerically it is very ill posed.

In this talk, we report progress on this problem on several fronts. First, we demonstrate that with a different kind of channel model, where the responses live in generic subspaces located on a small number of intervals, this problem becomes much more well-posed. Second, we introduce a realistic joint channel model, and show that estimating the parameters for this model amounts to estimating a rank-1 tensor from noisy linear observations. Finally, we give performance guarantees for estimating this tensor using a simple, efficient alternating minimization procedure. (Received September 15, 2016)