

Title: Multilinear Data Analytics: Methods and Applications

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Abstract:

In this talk we will focus on statistical signal processing methods for multilinear data (N-way array data or tensors) analytics and consider several problems - (a) tensor completion from missing entries (recover arbitrarily corrupted or missing data), (b) unsupervised clustering of tensor data (data classification), and (c) collaborative filtering of multilinear data for online learning and prediction (predict Netflix movie ratings or dynamical behavior across products and users).

We exploit a novel algebraic framework to derive new and robust algorithms for these tasks. We show the performance of these algorithms on 5-D and 4-D pre-stack seismic data completion, videocompletion/prediction from missing pixels, and separating true data from sparse corruptions (outlier detection). We also present a robust method for unsupervised clustering of images under different lighting conditions.