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Xiaodong Li* (xdgli@ucdavis) and **Ji Chen** (ljichen@ucdavis.edu). *Nonconvex Matrix Completion: Assumption-free Local Minimum Analysis and Applications in Memory-efficient Kernel PCA.*

In this talk, we study nonconvex matrix completion from a perspective of assumption-free approximation: with no assumptions on the underlying positive semidefinite matrix in terms of rank, eigenvalues or eigenvectors, we established the low-rank approximation error based on any local minimum of the proposed objective function. As interesting byproducts, when certain assumptions are imposed on the rank, eigenvalues, eigenvectors, and the sampling rates, corollaries of our main theorem improve the state-of-the-art results in the literature of nonconvex matrix completion with no spurious local minima. We also discussed how the proposed low-rank approximation framework is applied to memory-efficient Kernel PCA, and numerical experiments also show that our approach is competitive in terms of approximation accuracy compared to the well-known Nystrom algorithm. (Received August 14, 2018)