

STATISTICS COLLOQUIUM

MONDAY, FEBRUARY 06, 2012

TALK: 5:00 PM — SCIENCE CENTER RM. 705

“SINGULAR VALUE DECOMPOSITION FOR HIGH-DIMENSIONAL DATA”

**Dan (Daniela) Yang
Department of Statistics
Wharton School
University of Pennsylvania**

ABSTRACT

Singular value decomposition is a widely used tool for dimension reduction in multivariate analysis. However, when used for statistical estimation in high-dimensional low rank matrix models, singular vectors of the noise-corrupted matrix are inconsistent for their counterparts of the true mean matrix. In this talk, we suppose the true singular vectors have sparse representations in a certain basis. We propose an iterative thresholding algorithm that can estimate the sub-spaces spanned by leading left and right singular vectors and also the true mean matrix optimally under Gaussian assumption. We further turn the algorithm into a practical methodology that is fast, data-driven and robust to heavy-tailed noises. Simulations and a real data example further show its competitive performance.

This is a joint work with Andreas Buja and Zongming Ma.