STAT 679
High-Dimensional Statistical Estimation

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Lectures:  Tu/Th 12-1:15   Location:  24 Hillhouse Rm 107

Office Hours:  Wed 1:30-2:30

Course webpage:  http://www.stat.yale.edu/~snn7/courses/stat67fa13/

Course outline:

In this course we will review the recent advances in high-dimensional statistics. We will cover concepts in empirical process theory, concentration of measure, and random matrix theory in the context of understanding the statistical properties of high-dimensional estimation methods. In this discussion we will also overview the computational constraints that are involved with solving high-dimensional problems and touch upon concepts in convex optimization and online learning.

The course will begin with an overview of tools and ideas in high-dimensional statistics. In the second half of the semester students will be asked to present papers that have been discussed with me as well as produce a simple report on the results. Topics that we will cover include:

1. Overview of problems in high-dimensional statistics
   (a) Sparse vectors
   (b) Structured matrix estimation

2. Tools used to solve high-dimensional problems
   (a) Concentration of measure
   (b) Convex optimization
References:
There will be no set textbook for this course. We will rely on notes and papers as references throughout the semester. Those will be posted onto the class webpage.

Evaluation:
Evaluation will be primarily based on homework assignments as well as the paper lecture and report. There will be five homework assignments with roughly five problems per assignment. Each problem will be graded on a 0–3 scale with 0 being empty and 3 being the student attempted a solution in the correct direction.

Academic Policies: Please refer to the Yale College policies on academic dishonesty.