Mathematics, Statistics, and Computer Science **@ UIC**

Combinatorics and Probability Seminar

Singular values and vectors under random perturbation

Sean O'Rourke (CU Boulder)

Abstract: Computing the singular values and singular vectors of a large matrix is a basic task in high dimensional data analysis with many applications in computer science and statistics. In practice, however, data is often perturbed by noise. A natural question is the following. How much does a small perturbation to the matrix change the singular values and vectors? Classical (deterministic) theorems, such as those by Davis-Kahan, Wedin, and Weyl, give tight estimates for the worst-case scenario. In this talk, I will show how better estimates can be obtained when the perturbation is random. While the proof relies on techniques from random matrix theory, I will not assume any prior knowledge. This talk is based on joint work with Van Vu and Ke Wang.

Monday, April 17 at 3:00 PM in 612 SEO