NORTHERN ARIZONA UNIVERSITY

Department of Mathematics and Statistics
Colloquium
Tuesday October 16
AMB 164 4:00 pm

Outliers in the Spectrum of Products of Independent Random Matrices

Natalie Coston

Fall 2011 Outstanding Senior, CEFNS, NAU; 2018 PhD UC Boulder

Abstract

In this talk, I discuss random matrices and the limiting behavior of their eigenvalues. After covering some background material and historical results, I fix an integer $m \geq 1$ and consider the product of m independent $n \times n$ random matrices with independent and identically distributed (iid) entries as $n \to \infty$. Under suitable assumptions on the entries of each matrix, the limiting distribution of the eigenvalues of the product of random matrices is known and this same limiting distribution continues to hold if each iid random matrix is additively perturbed by a bounded rank deterministic error. However, the bounded rank perturbations may create one or more outlier eigenvalues. I describe the asymptotic location of the outlier eigenvalues, which extends a result of Tao for the case of a single iid matrix. I also consider several other types of perturbations, including multiplicative perturbations.

Refreshments at 3:45