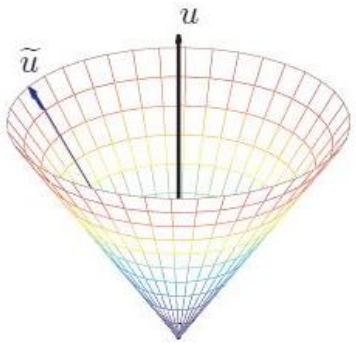
EECS 598: Random matrix theory, algorithms and signal processing applications

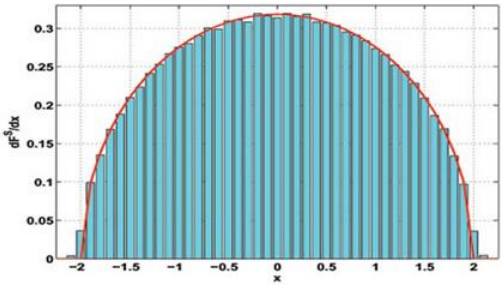
Tuesdays and Thursdays, 1:30 – 3:00 PM, Rm. 1024 FXB Blding (North Campus)
Credit Hours: 3, Instructor: Raj Rao Nadakuditi
Prerequisites: EECS 551 or Linear Algebra equivalent, Basic Probability

Course Description:
This course covers the theory and algorithms emerging from the study of random matrices as it is currently applied in signal processing, machine learning, statistics and science. Topics include random sample covariance matrices, random graphs, spectral limit theorems such as Wigner's semi-circle and Marcenko-Pastur laws, free probability, randomized numerical linear algebra, matrix statistics, passage to the continuum limit, moment methods, matrix completion and compressed sensing.



There will be a special focus on presenting the theory in a manner that facilitates the development of new applications and allowing students that already have a topic in mind to apply these ideas to their topic.

Emerging applications in signal processing, network analysis, wireless communications and statistical physics will be discussed. The course requirement will be a term project. Students will form teams of two or work individually. Each team will select a project topic, will study a set of papers related to the topic, will write a critique of the papers, and will give an oral presentation at the end of the semester. No textbook is required for this course. Throughout the lectures papers will be distributed to the class, and references to the relevant literature will be given.



For more information about this course please contact the instructor.