Data Science Seminar

Hosted by Department of Mathematical Sciences

- Date: Tuesday, November 26, 2017
- Time: 12:00pm – 1:00pm
- Room: WH-100E
- Speaker: Wei Yang (Binghamton University)
- Title: Random Covariance Matrix and the Marchenko-Pastur law

Abstract

Let x be a p-dimensional centered random vector, with some un- known covariance matrix Σ. Let x1 , · · · , xn be n i.i.d copies of x, we can form

S =sample mean of xi*xi's

Which is an example of a p×p random matrix. When {xi }_{i∈{n}} are realized, S is just a sample covariance matrix. If n is large, S by the Law of Large number is a good estimator for Σ. When the size n is limited, but n, p are comparable, the classical Marchenko-Pastur (MP) Law says that , the eigenvalues of S follows roughly the MP distribution. In this talk, we are going to use the Stieltjes Transformation (Resolvent) method to prove a version of the MP Law. The focus will be on the method of proof, a common technique in the theory of Random Matrices.