Advancement to Candidacy

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Structured and nonlinear random matrix theory

Abstract:

In this talk, we will introduce Toeplitz structured random matrices and review some asymptotic results of these matrices. We will briefly show the limiting Toeplitz law and recent result of central limit theorem for linear statistics of a specific structured Toeplitz matrix based on moment methods. Some challenges, future directions and applications of random Toeplitz matrices will also be mentioned in this talk. Secondly, we will introduce the nonlinear random matrices in random neural networks. In the linear proportional regime, the limiting eigenvalue distributions of conjugate matrices and empirical neural tangent kernels at initial have been studied via Stieltjes transform, which will help us better understand the deep neural networks. We will finally present a recent result of nonlinear random matrix theory beyond linear regime, where a deformed a Wigner law will appear.

Co-advisors: Todd Kemp and Ioana Dumitriu

Friday, August 13, 2021
12:00 PM
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