Department of Mathematics Seminar

Eigenvalues of non-linear matrices

By

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Abstract: This talk is concerned with the asymptotic empirical eigenvalue distribution of a non-linear random matrix ensemble. More precisely, we consider M= 1/m YY* where Y = f(WX) where W and X are random rectangular matrices with i.i.d. centered entries. The function f is bounded and applied pointwise. f can be seen as an activation function in (random) neural networks. We compute the asymptotic empirical distribution of this ensemble in the case where W and X have sub-Gaussian tails. This extends a result of Pennington where the case of Gaussian matrices W and X is considered. We also investigate the same questions in the multi layer case, regarding neural network applications. The limiting distribution and behavior of extreme eigenvalues is also investigated (quickly).

Date: 8 May 2024, Wednesday
Time: 15:30
Place: This is an online seminar. To request the zoom link, please send a message to f.atay@bilkent.edu.tr