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Finite Size Corrections to the Random Matrix Limit of the Distribution of the Length of Longest Increasing Subsequences

In a seminal work, Baik/Deift/Johansson established in 1999 that a double scaling limit tailored to the mode of the distribution of the length of longest increasing subsequences in random distributions is given by the $\beta=2$ Tracy-Widom distribution. Since the rate of approximation is rather slow we improve upon this limit by two alternative approaches. First, by a Stirling-type formula we get a numerically accessible approximation of the discrete distribution itself and second, by analytic de-Poissonization (used in this context for the first time), we establish formulas for the first two finite size corrections to the random matrix limit. Both approaches are related to the concept of H -admissible entire functions and the calculations (formula-wise and numerically) are based on representations of generating functions in terms of operator determinants. We derive expansions of the expected value and variance of the length distribution, exhibiting several more terms than previously known.

Wednesday, 26 October 2022

09:00 via Zoom

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