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The extreme singular values of random matrices: a geometric approach

Quantitative estimates of the largest and smallest singular values of non-Hermitian random matrices play an important role in several aspects. In particular, those estimates are used in numerical analysis, as an important step in determining the limiting spectral distribution for certain matrix models, and in the study of delocalization of the matrix eigenvectors. In this talk, I will attempt to outline geometric approach to estimating the extreme singular values, which is based on covering arguments and the use of random projections, combined with a variety of probabilistic tools.