

Stochastic Dominance for Products of Random Matrices

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While the study of behavior of singular values of random matrices has seen tremendous progress in recent decades, much less is known about those for products of random matrices. At the same time, product structures can be found in many places, especially in applications in data science. We establish comparison inequalities for some norms of products of independent random matrices with corresponding products of Gaussian matrices. Our results are non-asymptotic and apply for a wide class of random matrices, making it applicable in many settings. We use classical symmetrization techniques, both sharp and approximate, to produce near extremizers for distributional inequalities for such products. Joint work with X. Hu, G. Paouris, and P. Pivovarov.

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