The Weizmann Institute of Science
Faculty of Mathematics and Computer Science

Geometric Functional Analysis and Probability Seminar

Room 155, Ziskind Building
on Thursday, Jan 31, 2019
at 13:30

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Quantitative high-dimensional CLTs via martingale embeddings

Abstract:

We introduce a new method for obtaining quantitative convergence rates for the central limit theorem (CLT) in the high dimensional regime. The method is based on the notion of a martingale embedding, a multivariate analogue of Skorokhod's embedding. Using the method we are able to obtain several new bounds for convergence in transportation distance and in entropy, and in particular: (a) We improve the best known bound, for convergence in quadratic Wasserstein transportation distance for bounded random vectors; (b) We derive a non-asymptotic convergence rate for the entropic CLT in arbitrary dimension, for log-concave random vectors; (c) We give an improved bound for convergence in transportation distance under a log-concavity assumption and improvements for both metrics under the assumption of strong log-concavity.

In this talk, we will review the method, and explain how one might use it in order to prove quantitative statements about rates of convergence.