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.