מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Geometric Functional Analysis and Probability Seminar

Room 155 ,Ziskind Building
on Thursday, Jan 17, 2019
at 13:30

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Courant

Optimization of random polynomials on the sphere in the full-RSB regime

Abstract:

To compute the spectral norm of a p-tensor one needs to optimize a homogeneous polynomial of degree p over the sphere. When p=2 (the matrix case) it is algorithmically easy, but for p>2 it can be NP-hard. In this talk I will focus on (randomized) optimization in high-dimensions when the objective function is a linear combination of homogeneous polynomials with Gaussian coefficients. Such random functions are called spherical spin glasses in physics and have been extensively studied since the 80s. I will describe certain geometric properties of spherical spin glasses unique to the full-RSB case, and explain how they can be used to design a polynomial time algorithm that finds points within a small multiplicative error from the global maximum.