SCMS & SDS Joint Seminar

JOIN STATISTICS SEMINAR OF SCMS AND SDS

GEOMETRY OF NON-CONVEX LANDSCAPES: DEEP LEARNING, MATRIX COMPLETION, AND SADDLE-POINTS

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Lecture

Time: 10:30-11:30 am., Thursday, Dec. 21, 2017

Venue: Room 2201, East Main Guanghua Tower, Handan Campus

Abstract: We show that saddle points are easy to avoid for even Gradient Descent -- arguably the simplest optimization procedure. We prove that with probability 1, randomly initialized Gradient Descent converges to a local minimizer. The same result holds for a large class of optimization algorithms including proximal point, mirror descent, and coordinate descent.

Next, we study the problems of learning a two-layer ReLU network and the matrix completion problem. Despite the non-convexity of both problems, we prove that every local minimizer is a global minimizer. By combining with the previous algorithmic result on gradient descent, this shows that simple gradient-based methods can find the global optimum of these non-convex problems.

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