

Phase transitions in convex optimization problems with random data

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Abstract:

Signal reconstruction from random measurements is a central preoccupation in contemporary signal processing. In this problem, we acquire linear measurements of an unknown, structured signal through a random sampling process. Given these random measurements, a standard method for recovering the unknown signal is to solve a convex optimization problem that enforces our prior knowledge about the structure. The basic question is how many measurements suffice to resolve a particular type of structure.

Recent research has led to a comprehensive answer when the measurement operator follows the standard Gaussian distribution. This talk will summarize the established analysis of convex signal reconstruction with a Gaussian sampling model.