

Concentration inequalities

Resum de la línia de recerca.

An exciting area of probability theory with many applications in statistics, learning theory, high-dimensional geometry and discrete mathematics is that of concentration inequalities. Concentration inequalities deal with estimating deviations of complicated functions of independent random variables from their expectation. We have derived some easy-to-use inequalities that have been proved to be useful in a number of applications, see Devroye and Lugosi (2008) and Boucheron, Bousquet, Massart, and Lugosi (2005) for some of our more recent results. We will continue investigating this exciting field. In particular, we explore their connections to phase transitions and threshold phenomena that deal with the behavior of large random systems near critical point when the behavior changes suddenly and radically. We expect that the logarithmic Sobolev inequalities and their modifications that have been useful in the theory of concentration will provide a useful tool in understanding threshold phenomena.