Convergence rate for CLT of maxima in cubes
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Abstract

Let \(X_i, i = 1, 2, \ldots, n\) be a random sample from a uniform distribution over a \(d\)-dimensional cube. A point \(X_i\) is said to be controlled by another point \(X_j\) if each component of \(X_i\) is not larger than the corresponding component of \(X_j\). A point \(X_i\) is said to be a maximum point in \(X_i, i = 1, 2, \ldots, n\) if it is not controlled by any other points. An interesting problem is to investigate the limiting behavior of \(K_n\), the number of maximum points in \(X_i, i = 1, 2, \ldots, n\), as \(n\) tends to infinity.

If \(d = 2\), the problem can be reduced to a record problem and both the exact as well as the limiting distributions are known, in explicit form. Recently, some colleagues and I obtained the central limit theorem with certain convergence rate by applying the Stein method for the general \(d\).