

Multivariate normal approximation of stabilising functionals of Poisson processes

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In this talk functionals of Poisson processes are studied which are sums of scores of the underlying points. It is assumed that the scores stabilise in the sense that the score of a point is determined by the points in a random neighbourhood given by a so-called radius of stabilisation. We consider a vector of sums of stabilising scores. For the situation that the radii of stabilisation decay exponentially fast and some moment assumptions are satisfied, quantitative bounds for the multivariate normal approximation are established. The results deal with several distances including a multivariate generalisation of the Kolmogorov distance and lead to rates of convergence that are in general unimprovable. Several examples concerning spatial random graphs will be discussed. The proofs of the main results rely on the Malliavin–Stein method for multivariate normal approximation and a careful analysis of the covariance structure.

This talk is based on joint work with J. E. Yukich (Lehigh University).