

Normal Approximation in Stochastic Geometry and Particle Systems

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Many random quantities of interest arising in stochastic geometry can be expressed the sum, over points of a homogeneous Poisson process restricted to a window of size n in d -space, of contributions which are *exponentially stabilizing*. We give an $O(n^{\varepsilon-1/2})$ normal approximation result for such quantities, along with an $O(n^{\varepsilon-1/2d})$ multivariate normal approximation result for disjoint windows. A similar idea can be used to normally approximate the statistics associated with interacting particle systems on graphs.

Most of the work described in this talk appears in joint papers with Joseph Yukich (Stein's Method and Applications, eds. AD Barbour and LHY Chen, World Scientific 2005), with Andrew Wade (Journal of Statistical Theory and Practice, to appear) and with Aidan Sudbury (Annals of Applied Probability 2005).