

TOPICS IN POISSON APPROXIMATION

A. D. Barbour, Universität Zürich

The Poisson ‘law of small numbers’, first popularized for statistical purposes by von Bortkewitsch (1898), has since become a common feature in probabilistic modelling. However, until Stein’s method was introduced in this context by Chen (1975), assessing its accuracy as an approximate model was rather difficult. In this course of lectures, we shall show how Stein’s method can be applied in a variety of situations to give very explicit error bounds, first when approximating the distribution of the total number of weakly dependent events that occur by a Poisson distribution, and then when approximating the distribution of the point process of such events by that of a Poisson process. The theoretical method will be illustrated by applications to molecular sequence matching, to the properties of ‘small world’ networks arising in epidemiology, and to the Johnson–Mehl model of crystal growth. See also:

A. D. Barbour (2001) Topics in Poisson approximation, *Handbook of Statistics*, vol. 19, ch. 4, eds. D. N. Shanbhag and C. R. Rao, Elsevier Science, Amsterdam.