

Recent developments in Stein’s method

Christian Döbler¹

Stein’s method of distributional approximation has become a popular technique for estimating the distance between the distribution of a given random variable W and that of another random variable Z whose law can be characterized by some linear differential or difference operator. Being first established for the univariate normal distribution by C. Stein it has been extended over the years to many other distributions like the Poisson, gamma, exponential, beta and multivariate normal distributions by various authors. In this talk we present recent results on the normal approximation of non-linear functionals of independent random variables like degenerate U -statistics [1] and random sums [2] which have been derived via Stein’s method. If time allows, then we will also discuss the case of Gamma approximation of degenerate U -statistics and/or the development of Stein’s method for functions of multivariate normal vectors from [3] and [4] as well as suitable applications.

References

- [1] C. DÖBLER AND G. PECCATI, Quantitative de Jong theorems in any dimension, *arXiv:1603.00804* (2016).
- [2] C. DÖBLER, New Berry-Esseen and Wasserstein bounds in the CLT for non-randomly centered random sums by probabilistic methods, *ALEA - Latin American Journal of Probability and Mathematical Statistics* **XII**, no. 2 (2015), 863 – 902.
- [3] R. E. GAUNT, Stein’s method for functions of multivariate normal random variables, *arXiv:1507.08688* (2015).
- [4] R. E. GAUNT AND G. REINERT, The rate of convergence of some asymptotically chi-square distributed statistics by Stein’s method, *arXiv:1603.01889v2* (2016).

¹Mathematics Research Unit, University of Luxembourg,
Campus Kirchberg, Université du Luxembourg, 6, rue Richard Coudenhove-
Kalergi L-1359 Luxembourg
`christian.doebler@uni.lu`