
Joint Statistics Seminar

The Hong Kong University of Science and Technology

Normal Approximation Using Stein Couplings

by

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Venue: Room 3301 (Lift 17/18)

Abstract

Over the last few decades, Stein's method has become an important tool for distributional approximation, in particular in the context of normal approximation. Many variants of the approach have been developed under different assumptions on the dependence of the involved random variables. We propose a general framework that unifies many of these approaches and we provide theorems for normal approximation where the error bounds are formulated in terms of couplings. At the heart of the approximation is a "Stein coupling" that satisfies a basic linearity condition and provides a first bound on the proximity to the normal distribution in the Wasserstein or the Kolmogorov metric. Once this coupling is established, normal approximation becomes a variance bounding exercise. Sometimes, the main error term in the bound can be hard to compute or does not give optimal results in terms of moment assumptions. However, at the cost of assuming a more detailed structure in the problem under investigation, it is often possible to extend the basic coupling by additional auxiliary random variables in order to replace those quantities by much simpler expressions.

❖ *All interested are welcome!* ❖

For details, please contact ISOM Department.