Title:

A central limit theorem for Latin hypercube sampling with dependence and application to exotic basket option pricing

Abstract:

We consider the problem of estimating $\mathbb{E}[f(U^1, \ldots, U^d)]$, where $(U^1, \ldots, U^d)$ denotes a random vector with uniformly distributed marginals. In general, Latin hypercube sampling (LHS) represents a powerful solution for this kind of high-dimensional numerical integration problem. In the case of dependent components of the random vector $(U^1, \ldots, U^d)$ one can achieve more accurate results by using so-called Latin hypercube sampling with dependence (LHSD). We state a central limit theorem for the d-dimensional LHSD estimator and compare the effectiveness of Monte Carlo and LHSD estimators via numerical pricing of financial derivatives.