Fast QMC matrix vector multiplication in option pricing

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Abstract

Quasi-Monte Carlo methods are equal weight quadrature rules used for approximating high dimensional integrals over the unit cube.

In this talk we discuss how quasi-Monte Carlo rules can be modified in certain linear problems to speed up the computation time. The main idea is to design quasi-Monte Carlo rules such that the matrix formed by the quadrature points permits a fast matrix-vector multiplication. This method can be applied to reduce the computational cost in generating normally distributed samples with general covariance matrix. We apply this method to option pricing problems from finance. This is joint work with Q. T. Le Gia, F. Y. Kuo, Ch. Schwab.

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