

Povzetek

V diplomskem delu obravnavamo metodo kvazi Monte Carlo. V uvodu predstavimo metodo Monte Carlo. V poglavju 2 obravnavamo generiranje naključnih števil in spremenljivk. Te potem uporabimo za kvazi Monte Carlo integracijo. Spoznali bomo tudi metode za generiranje slučajnih spremenljivk s standardno normalno porazdelitvijo. Te so zelo uporabne v financah. V tretjem poglavju se osredotočimo na metodo kvazi Monte Carlo. Spoznali bomo nabore in zaporedja točk, ki jih uporabljamo za aproksimacijo kvazi Monte Carlo. Obravnavali bomo napako metode in si pogledali, kako lahko napako omejimo. Diplomsko delo bomo zaključili s primerom uporabe metode kvazi Monte Carlo v financah.

Math. Subj. Class. (2010): 65C05, 65C10, 65C20.

Ključne besede: generiranje naključnih števil, kvazi Monte Carlo, različnost, ocene, nizko različnostna zaporedja.

Key words: generating random numbers, quasi-Monte Carlo, discrepancy, bounds, low-discrepancy sequences.

Literatura

- [1] Brandimarte, P. (2006), *Numerical Methods in Finance and Economics*, Statistics in practice, Wiley-Interscience.
- [2] L'Ecuyer, P. (1988), Efficient and Portable Combined Random Number Generators, *Communications of the ACM* 31 : 742 – 749.
- [3] Glasserman, P. (2003), *Monte Carlo Methods in Financial Engineering*, Applications of Mathematics, Springer, New York.
- [4] Hull, T.E. in Dobell, A.R. (1962), Random Number Generators, *SIAM Review*, vol. 4, no. 3 : 230 – 254.
- [5] Knuth, D.E. (1998), *The Art of Computer Programming, Volume II: Seminumerical Algorithms*, Third Edition, Addison Wesley Longman, Reading, Mass.
- [6] Lai, Y. and Spanier, J. (1998), *Applications of Monte Carlo/Quasi-Monte Carlo Methods in Finance: Option pricing*, Springer.
- [7] Maidanov, S.A., Monte Carlo European Options Pricing Implementation Using Various Industry Library Solutions,
http://cache-www.intel.com/cd/00/00/06/13/61382_61382.pdf.
- [8] Niederreiter, H. (1992), *Random Number Generation and Quasi-Monte Carlo Methods*, SIAM, Philadelphia.
- [9] Ore, O. (1948), *Number Theory and its History*, McGraw-Hill, New York.
- [10] Proinov, P.D. (1988), Discrepancy and Integration of Continuous Functions, *J. Approximation Theory*, pp. 121 – 131.
- [11] Shonkwiler, R.W. and Mendivil, F. (2009), *Explorations in Monte Carlo Methods*, Springer.