

Efficient Random Number Generation on the GPU

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Random numbers have numerous applications including statistical sampling, cryptography, and simulation. Monte Carlo methods use repeated random sampling in order to approximate a solution to a problem which cannot be solved exactly. Monte Carlo methods are inherently parallelizable because each trial is independent. The key component to these simulations are the random number generators which provide each trial with input. Most random number generators, however, are optimized for CPUs, which are not fast enough for performing large scale simulations. We examine multiple random number generators' performance on GPUs, as well as price financial options using Monte Carlo simulations.