

RNGstreams — An R package for multiple independent streams of uniform random numbers

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The core R implementation of uniform random number generation uses a global procedure that can be used for random generation purposes. It can be changed by means of the `RNGkind` function. However, this approach is not always convenient for simulation. In this contribution we propose a new approach that uses classes where independent instances of uniform random number generators can be created. Random streams can then be generated by methods of this class. Moreover these streams can be independently reset to their starting values. It is also easy to generate common or antithetic random variates as they required for variance reduction techniques. Another important feature is its ability to use this approach for parallel computing, as this usually requires independent streams of uniform random numbers on each node. In a first implementation these instances can be used together to replace the build-in RNGs. But with such a concept it would be possible to run random routines with different RNGs when the instance of the random stream is given as an argument. Yet we have implemented an interface to two sources of uniform random number generators: the `rngstreams` library by P. L'Ecuyer (<http://www.iro.umontreal.ca/lecuyer>) and O. Lendl's implementation of various types random number generators (LCG, ICG, EICG), see <http://statistik.wu-wien.ac.at/prng/>.