Exact Tsallis Random Number Generator with its Applications and Ramifications in the Optimization of Continuous Function

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ABSTRACT

Tsallis distribution was proposed by C. Tsallis in 1996 to solve the slow convergence problem of simulated annealing. It is shown that Tsallis ’ s generalized simulated annealing is much faster than the classical simulated annealing (“ Boltzmann machine ”) and fast simulated annealing (“ Cauchy machine ”). However, Tsallis distribution is very complicated and its random variable could not be generated by ordinary simulation techniques such as inversion and rejection methods. Tsallis distribution has two parameter qv and T. We standardize the Tsallis distribution by setting T=1. When T not equal to 1 we use the linear transform to transform standardized Tsallis distribution. The standardized Tsallis distribution can be simulated as follow. When qv->1 it is Normal distribution. When 1<qv<qv

Keywords : Ratio of uniform、GSA、Tsallis distribution、random number generator、generalized simulated annealing、convex enveloping polygon

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