

UNU.RAN - A library for Universal Non-Uniform RANDOM variate generators

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ROOT like other libraries for scientific computing provide routines especially tailored for sampling from standard distributions, e.g. the Gaussian distribution. This approach provides fast and easy to use algorithms for frequently used distributions. However, for specialized simulation problems or for sampling from non-standard distributions there are only a few algorithm which provide approximate solutions. The UNU.RAN library for non-uniform random variates is based on the idea of universal (also called black-box) methods. A single piece of code which is implemented and tested only once can generate from many target distributions. The user has to provide some information like the density function and sometimes the mode. The resulting routines are exact, carefully tested, quite fast, and often they do not depend on the target distribution. In this talk we explain the design principles of the UNU.RAN library and show by means of some examples how it can be used within ROOT.

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