

Tina's Random Number Generator Library

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Tina's Random Number Generator Library (TRNG) is a state of the art C++ pseudo-random number generator library for sequential and parallel Monte Carlo simulations. Its design principles are based on a [proposal](#) for an extensible random number generator facility, that has become part of the C++11 standard.

The TRNG library features an object oriented design, is easy to use and has been speed optimized. Its implementation does not depend on any communication library or hardware architecture. TRNG is suited for shared memory as well as for distributed memory computers and may be used in any parallel programming environment, e.g. Message Passing Standard, OpenMP or CUDA. All generators, that are implemented by TRNG, have been subjected to thorough statistical tests in sequential and parallel setups.



Download

Starting from version 4.9, the TRNG library is distributed under the terms of a BSD style license (3-clause license). Earlier TRNG versions are distributed under the GNU Public License (GPL) Version 2. You may [browse the source on github](#) or [download specific releases](#).

TRNG versions prior TRNG 4.0 are not source compatible with older versions and are provided solely for historical reasons.

- [trng-3.2.tar.bz2](#)
- [trng-3.1.tar.bz2](#)
- [trng-3.0.tar.bz2](#)
- [trng-2.2.tar.gz](#)
- [trng-2.1.tar.gz](#)
- [trng-2.0.tar.gz](#)
- [trng-1.0.2.tgz](#)
- [trng-1.0.1.tgz](#)
- [trng-1.0.tgz](#)

Documentation and resources

TRNG documentation

- Heiko Bauke
«Tina's Random Number Generator Library»
All you need to know about the TRNG library.
- Walter E. Brown, Mark Fischler, Jim Kowalkowski, Marc Paterno
«Random Number Generation in C++0X: A Comprehensive Proposal, version 2»
- Pseudo-random number generation in C++ 11

Conferences and presentations

- Eighth International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing

Pseudo-random numbers

- Donald E. Knuth
«The Art of Computer Programming 2. Seminumerical Algorithms»
Addison-Wesley Longman, 3rd edition, 1998
- William H. Press, Saul A. Teukolsky, William T. Vetterling, Brian P. Flannery
«Numerical Recipes. The Art of Scientific Computing»
Cambridge University Press, 3rd revised edition, 2007

Research papers

- Heiko Bauke and Stephan Mertens
«Random Numbers for Large Scale Distributed Monte Carlo Simulations»
Physical Review E, vol. 75, nr. 6, article 066701 (2007)
See also [arXiv:cond-mat/0609584](https://arxiv.org/abs/cond-mat/0609584).
- Heiko Bauke and Stephan Mertens
«Pseudo Random Coins Show More Heads Than Tails»
Journal of Statistical Physics, vol. 114, pp. 1149–1169 (2004)
See also [arXiv:cond-mat/0307138](https://arxiv.org/abs/cond-mat/0307138) or some articles in popular journals about our work:
 - nature science update
 - «Heads it's zero» by NewScientist
 - Ivars Peterson's MathTrek article about this paper
 - a radio report «Digitale Dominanz der Null» by Deutschlandfunk
 - «Die verfluchte Null» by Berliner Zeitung
 - «Kopf oder Zahl» by spektrumdirekt.
- Stephan Mertens and Heiko Bauke
«Entropy of Pseudo Random Number Generators»
Physical Review E, vol. 69, nr. 5, article 055702(R) (2004)
See also [arXiv:cond-mat/0305319](https://arxiv.org/abs/cond-mat/0305319).
- Heiko Bauke
«Theorie und Implementation von parallelisierten

Pseudozufallszahlengeneratoren»
Forschungsbeleg, Universität Magdeburg

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