Re-seeding invalidates tests of random number generators.

Summary: C. Kim, G. H. Choe and D. H. Kim [Appl. Math. Comput. 199, No. 1, 195–210 (2008; Zbl 1142.65003)] recently presented a test of random number generators based on the gambler’s ruin problem and concluded that several generators, including the widely used Mersenne Twister, have hidden defects. We show here that the test in [loc. cit.] suffers from a subtle, but consequential error: re-seeding the pseudorandom number generator with a fixed seed for each starting point of the gambler’s ruin process induces a random walk of the test statistic as a function of the starting point. The data presented in [loc. cit.] are thus individual realizations of a random walk and not suited to judge the quality of pseudorandom number generators. When generating or analyzing the gambler’s ruin data properly, we do not find any evidence for weaknesses of the Mersenne twister and other widely used random number generators.

MSC:
65C10 Random number generation in numerical analysis

Keywords:
random walk; gambler’s ruin; pseudorandom number generator

Software:
MersenneTwister; GSL; MRG32k3a; TestU01

Full Text: DOI

References:
[8] L’Ecuyer, P., Good parameters and implementations for combined multiple recursive random number generators, Operations research, 47, 139-164, (1999) · Zbl 1042.65505

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