

IT Solutions for Stochastic Mathematical and Simulation Modeling Tasks in Engineering Education

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Abstract. For the first time in the engineering education system, the scientific results of the development and research of a pseudorandom number generator software in stochastic problems of mathematical and simulation modeling are presented. The research methodology includes efficient algorithms for generating pseudorandom numbers based on the weak normality property of irrational constants (according to Borel), as well as the application of a program for implementing the Monte Carlo method in solving stochastic problems. Examples of using the pseudorandom number generator in stochastic modeling problems are provided.

The following are considered:

Discrete dynamic models of wave processes in porous sound-absorbing materials;

An animation model of the dynamics of rotational Brownian motion;

A program for graphical visualization of quantum entanglement of photons, illustrating the violation of Bell's inequality.

The reliability and novelty of the scientific results are confirmed by certificates of state registration of computer programs.

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