

Quantifying the impact of randomness in simulation based studies



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Abstract

Many scientific studies in Wireless Sensor Networks rely on simulations. In turn, simulations are heavily dependent on random numbers. Researchers generally use random numbers generated through common random number generating APIs of programming languages. In this paper, we study the impact of using different types of random numbers in a simulation based study of WSN. We use eight different types of random numbers generated through various algorithms. These random numbers are first evaluated using standard random number testing procedures such as Run Test, Serial Test, and Chi square Test. Then we use the same random numbers in a Markov chain based probabilistic study of Wireless Sensor Networks. Our empirical analysis reveals that choice of random numbers has an impact over simulation based studies.