Discrete-Event Computer Simulation as a Paradigm of Scientific Investigations

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Abstract

Advances of computer technology initiated in the twentieth century have resulted in adoption of computer simulation as the most popular tool of performance evaluation studies of such complex stochastic dynamic systems as e.g. modern multimedia telecommunication networks. Such wide-spread reliance on simulation studies raises the question of credibility of their results. This question needs to be answered before computer simulation can be objectively accepted as an independent, self-sufficient paradigm of scientific investigations.

In this talk, having briefly overviewed the main necessary conditions of any trustworthy simulation study conducted for performance evaluation of stochastic dynamic systems, we will focus on simulation studies with on-line output data analysis. The perils and pitfalls of quantitative discrete-event computer simulation will be considered, together with its fast distributed version, known as Multiple Replications in Parallel.

Bio of Professor Krzysztof Pawlikowski

Krzysztof Pawlikowski is a Professor in Computer Science and Software Engineering at the University of Canterbury, in Christchurch, New Zealand. He received a Ph.D. degree in Computer Engineering from Gdansk University of Technology, Poland, and worked at that university until February 1983. The author of over 140 journal and conference papers and four books has given invited lectures at over 80 universities and research institutes in Asia, Australia, Europe and North America. He was the Alexander-von-Humboldt Research Fellow (Germany) in 1983-84 and 1999, and a Visiting Professor at universities in Australia, Italy, Germany and the USA. His research interests include performance modelling of multimedia telecommunication networks, teletraffic modelling, computer simulation and distributed processing.