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Prof. Dmitry A. Zaitsev

(Senior Member of the IEEE and ACM International Humanitarian University, Odessa, Ukraine; Vistula University, Warsaw, Poland)

"Modeling systems with infinite Petri and Sleptsov Nets"

Petri net is a convenient tool for modeling systems based on a laconic concept of conditions and events represented as bipartite directed graph with a dynamic process defined on it. Petri net allows application of both mathematical analysis and simulation techniques. When studying systems of definite structure, results obtained for systems of any size are appreciated, that constitutes basic motivation to use an abstraction of infinite Petri net. For its finite specification, parametric expressions are applied and results of analysis are obtained in parametric form as well, which allows us to draw conclusions for nets of any size having definite structures. Tree-like, square, triangular, hexangular structures on plane were studied and generalized on d-dimensional space as a hypercube and a hypertorus. A node (cell) in a lattice can represent a packet switching device, an alive cell, an atom or particle etc. In a Sleptsov net that generalizes a Petri net, multiple occurrence of the same event is allowed, which allows their application for fast concurrent computations having hyper-performance. Combining Sleptsov nets according to definite difference schemes for numerical solving of partial differential equations on hypercubes and other structures allows us considerable speed-up of computations.

Prowadzący

Agnieszka Majczyna