

Validation of Stochastic Systems

December 8-11, 2002, Schloss Dagstuhl

About this seminar

Traditionally, the area of model-based performance and dependability evaluation and the area of formal specification and verification of systems have been approached completely independently of each other. However, increasingly, system properties related to performance and dependability cannot be seen separately from issues concerning the formal correctness of systems, that is, the notion of "correctness" includes aspects of both performance and dependability. Therefore, a separate treatment of these system aspects becomes less appropriate.

Over the last few years, good progress has been made in combining techniques from these previously separate fields. Active areas of research are model-checking procedures for stochastically timed systems and deductive verification techniques in which time bounds play a role. However, all these results are currently only available in state-of-the-art research literature, and, moreover, spread over journals and conferences of different research communities. It goes without saying that there are currently no textbooks available on this subject. Hence, to obtain a good overview of the important results and about the open research topics in this area, a structured review of the literature seems most appropriate and timely.

Aim of the seminar

The aim of the seminar was to bring together (primarily young) researchers working in or starting to work in this area (PhD students, fresh PhDs, or maybe even MSc students; also established researchers could apply). The seminar was devoted to the assembly of a structured overview (in terms of presentations and papers) of the state-of-the-art.

- Call for Participation
- Participants
- Programme

Organisers

- Christel Baier, University of Bonn, Germany
- Boudewijn Haverkort, RWTH Aachen, Germany
- Holger Hermanns, University of Twente, Netherlands
- Joost-Pieter Katoen, University of Twente, Netherlands
- Markus Siegle, University of Erlangen
- Frits Vaandrager, University of Nijmegen, Netherlands

About the GI/Dagstuhl research seminar series

Since 1997 the Gesellschaft für Informatik (GI) (German Computer Society) organizes research seminars on current topics in computer science. They are primarily addressed at graduate students and recent PhDs that actively want to learn about new developments. Participants are selected on the basis of an application (see the call for participation). The maximum number of participants is usually limited to 20. So far, there have been GI/Dagstuhl seminars on the following topics:

- Graph Drawing
- Proof Verification and Approximation Algorithms
- Automaten, Logiken und unendliche Spiele
- Efficient Methods for Geometric Modelling and Scientific Visualization
- Algorithms for Memory Hierarchies

Participants

As special guests, Gianfranco Ciardo, College of William and Mary, Williamsburg, Virginia, USA, and Diego Latella, CNUCE/CNR, Pisa, Italy took part and gave an introductory lecture on stochastic Petri nets.

In the summer of 2003, a tutorial volume comprising the contributed papers will be published in Springer's Lecture Notes in Computer Science series.

Area 1: Modelling stochastic systems

- Ana Sokolova, Uni Eindhoven, Netherlands: Probabilistic automata based models
- Pedro D'Argenio, Uni Cordoba, Argentina, Mario Bravetti, Uni Bologna, Italy: Concepts, Discussions and Relations of Stochastic Process Algebras with General Distributions
- Natalia Lopez, Manuel Nunez, Uni Madrid, Spain: An overview of probabilistic process algebras and their equivalences
- Daulet Turetayev, Uni Twente: Nondeterminism in stochastic modelling

Area 2: Model checking of stochastic systems

- Benedikt Bollig, RWTH Aachen, Martin Leucker: Verifying qualitative properties of probabilistic programs
- Frank Grössner, Frank Ciesinski, Uni Bonn, Germany: On probabilistic computation tree logic
- Jeremy Sproston, Uni Torino, Italy: Model Checking for Probabilistic Timed Systems
- Lucia Cloth, RWTH Aachen, Germany: Specification and Verification of Markov Reward Models

Area 3: Representing large state spaces

- Rashid Mehmood, Uni Birmingham, UK: Serial disk-based analysis of large stochastic models
- Alexander Bell, RWTH Aachen, Germany: Disk-based and distributed generation and analysis of large stochastic models
- Peter Buchholz, Uni Dresden, Peter Kemper, Uni Dortmund, Germany: Kronecker based matrix representations for large Markov models
- Andrew Miner, Iowa State, USA, Dave Parker, Uni Birmingham, UK: Symbolic representations and analysis of large state spaces
- Kai Lampka, Matthias Kuntz, Uni Erlangen, Germany: Probabilistic methods in state analysis

Area 4: Deductive verification of stochastic systems

- Gethin Norman, Uni Birmingham, UK: Analysing Randomized Distributed Algorithms
- Michael Huth, Imperial College, London, UK: An abstraction framework for mixed non-deterministic and probabilistic systems
- Phillipe Schnoebelen, ENS Cachan, France: The verification of probabilistic Lossy channel systems

Boudewijn Haverkort, Lucia Cloth, February 14, 2003
