Probabilistic Models for Verification

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In the last several decades the need of verifying correctness, deadlock-freeness or livelyness of software and/or hardware systems has been recognized and intensively studied. Techniques like model-checking and process algebra together with suitable behavior equivalences were developed and employed for verification of systems represented by automata models.

The classical model is the labelled transition system modelling the so-called qualitative aspects of behavior. However, it is often important that the models also incorporate quantitative aspects of behavior such as time and probability.

This talk focuses on probabilistic models of systems. The models are some sort of automata enriched with probabilistic information. I will give an overview and an expressiveness comparison of various probabilistic models with respect to strong bisimilarity semantics. In the background of the expressiveness result there is the theory of coalgebras providing a unified framework for treating various dynamic systems. If time permits, we will briefly discuss other behavior equivalences rather than bisimilarity.

Bio   Ana Sokolova obtained her Bachelor and Master degree in Computer Science at the "St. Cyril and Methodius" University in Skopje, Macedonia. She worked there at the department of Computer Science as a teaching and research assistant until 2001, when she took a PhD candidate position at the Technical University of Eindhoven, The Netherlands, in the Formal Methods Group. During her PhD studies she was also affiliated with the Embedded Systems Institute in Eindhoven. She obtained her PhD degree in 2005 from the TU Eindhoven. Since then she is employed as a post-doc researcher at the Radboud University of Nijmegen, The Netherlands, in the Security of Systems Group. Her research interests are in the field of probabilistic modelling, behavior equivalences, coalgebras, theoreticalsecurity and formal methods in general.

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