Guest Lecture

HAEC

Probabilistic Model Checking: Advances and Applications

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Wednesday, June 27, 2018 at 10:30 am
Room: Andreas-Pfitzmann-Bau, Nöthnitzer Str. 46, APB 3027

Abstract:

Probabilistic model checking is a technique for formally verifying quantitative properties of systems that exhibit stochastic behavior. It can provide formal guarantees on a wide range of system properties, such as safety, reliability, energy efficiency or security, and can be used to investigate trade-offs between them. This talk will give an overview of the probabilistic mode checking tool PRISM, and describe some of the current advances being made in its development. This includes techniques for controller synthesis and multi-objective verification, as well as support for new probabilistic models such as stochastic games and partially observable Markov decision processes. These will be illustrated with applications from various domains including robotics, energy management and task scheduling.

Bio:

David Parker is a professor (reader) at the School of Computer Science, University of Birmingham (UK) and a visiting lecturer at the Department of Computer Science, University of Oxford (UK).

He is the lead developer of the probabilistic model checker PRISM (www.prismmodelchecker.org), which was initially developed as part of his Ph.D. thesis (University of Birmingham, 2002). PRISM is a widely used tool, with more than 60,000 downloads, used in teaching, as the base of research in the area of quantitative formal verification as well as in a variety of industrial domains.

He is an expert in the theoretical foundations of probabilistic model checking and quantitative formal verification, their practical implementation as well as the deployment to a wide range of application domains, including robotics and artificial intelligence. He has more than 110 publications and regularly serves in the program committees for the preeminent conferences in the area of practical verification (TACAS, CAV) and other top conferences. His work is supported by research projects funded by, amongst others, EPSRC, the EU, DARPA and Google Summer of Code.

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