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Remarks on testing probabilistic processes. (English) [Zbl 1277.68121]


Summary: We develop a general testing scenario for probabilistic processes, giving rise to two theories: probabilistic may testing and probabilistic must testing. These are applied to a simple probabilistic version of the process calculus CSP. We examine the algebraic theory of probabilistic testing, and show that many of the axioms of standard testing are no longer valid in our probabilistic setting; even for non-probabilistic CSP processes, the distinguishing power of probabilistic tests is much greater than that of standard tests. We develop a method for deriving inequations valid in probabilistic may testing based on a probabilistic extension of the notion of simulation. Using this, we obtain a complete axiomatisation for non-probabilistic processes subject to probabilistic may testing.

For the entire collection see [Zbl 1273.68018].

MSC:
68Q55 Semantics in the theory of computing
68Q85 Models and methods for concurrent and distributed computing (process algebras, bisimulation, transition nets, etc.)
68Q87 Probability in computer science (algorithm analysis, random structures, phase transitions, etc.)

Keywords:
probabilistic processes; nondeterminism; CSP; transition systems; testing equivalences; simulation; complete axiomatisations; structural operational semantics

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