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Qualitative analysis of VASS-induced MDPs. (English) Zbl 1475.68199


Summary: We consider infinite-state Markov decision processes (MDPs) that are induced by extensions of vector addition systems with states (VASS). Verification conditions for these MDPs are described by reachability and Büchi objectives w.r.t. given sets of control-states. We study the decidability of some qualitative versions of these objectives, i.e., the decidability of whether such objectives can be achieved surely, almost-surely, or limit-surely. While most such problems are undecidable in general, some are decidable for large subclasses in which either only the controller or only the random environment can change the counter values (while the other side can only change control-states).

For the entire collection see [Zbl 1333.68011].

MSC:
68Q85 Models and methods for concurrent and distributed computing (process algebras, bisimulation, transition nets, etc.)
68Q60 Specification and verification (program logics, model checking, etc.)
68Q87 Probability in computer science (algorithm analysis, random structures, phase transitions, etc.)

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References:


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