Summary: This paper proposes to enhance compositional verification of the nonblocking property of discrete event systems by introducing annotated automata. Annotations store nondeterministic branching information, which would otherwise be stored in extra states and transitions. This succinct representation makes it easier to simplify automata and enables new efficient means of abstraction, reducing the size of automata to be composed and thus the size of the synchronous product state space encountered in verification. The abstractions proposed are of polynomial complexity, and they have been successfully applied to model check the nonblocking property of the same set of large-scale industrial examples as used in related work.

MSC:
93C65 Discrete event control/observation systems
94C15 Applications of graph theory to circuits and networks

Keywords:
discrete event systems; finite state machines; model checking; nonblocking

Software:
Supremica; UMDES

Full Text: DOI Link

References:

Edited by FIZ Karlsruhe, the European Mathematical Society and the Heidelberg Academy of Sciences and Humanities © 2022 FIZ Karlsruhe GmbH


This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.