Symbolic Synthesis of a Class of Discrete-event Controllers for Process Systems

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Abstract
This paper presents a predicate-based symbolic synthesis framework for discrete-event controllers forcing at most one control action in each stage of the control pattern. Binary Decision Diagrams (BDD)-encoded algorithms carry out the calculations required to synthesize a controller of this nature. Numeric experiments show a better performance than other known algorithms. Controllers for systems with state spaces of up to $2.9 \times 10^6$ were synthesized in a standard PC without using decomposition or modularization. The synthesis tools are available from www.gdl.cinvestav.mx/sspc.

Keywords: Discrete-event systems, controller synthesis, forced actions

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