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Abstract

We propose a categorization of action race conditions which occur in the specification of a concurrent system given as a collection of communicating labeled transition systems. We present several conditions to detect action races in the concurrent system operating in three different environments: a sequential-slow environment that allows execution of external actions only in stable states, a sequential-fast environment that supports the sequential execution of an action sequence before the next stable state is reached, and a concurrent environment that performs independent actions simultaneously. Race analysis facilitates the design of testers that can execute test actions without races at a highest possible speed.

Keywords

Concurrent systems, communicating LTS, action race analysis, race-free testing, test execution.