Project Abstract

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Decidability of Shared Memory Safety

As modern CPUs see a rapid increase in number of cores, the design and verification of efficient concurrent algorithms becomes critical for getting the most performance on this hardware. This work focuses the decidability of safety verification for specific models of shared-memory systems.

In a parameterized asynchronous shared-memory system, there exists a leader process D, and an arbitrary number of contributor processes C. C and D are restricted in that they must be a transition system, like those generated by pushdown automata or petri nets. This system can be used to prove the decidability of verification of safety properties in the (C,D)-system.

Our presentation will walk through the steps of constructing a (C,D)-system and using that system to prove decidability for a large set of concurrency models.

Paper citation:

La Torre, Salvatore, Anca Muscholl, and Igor Walukiewicz. "Safety of parametrized asynchronous shared-memory systems is almost always decidable." *26th International Conference on Concurrency Theory (CONCUR 2015)*. Schloss Dagstuhl-Leibniz-Zentrum fuer Informatik, 2015.