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Improved multi-core nested depth-first search. (English) [Zbl 1374.68281](#)

Chakraborty, Supratik (ed.) et al., Automated technology for verification and analysis. 10th international symposium, ATVA 2012, Thiruvananthapuram, India, October 3–6, 2012. Proceedings. Berlin: Springer (ISBN 978-3-642-33385-9/pbk). Lecture Notes in Computer Science 7561, 269-283 (2012).

Summary: This paper presents CNDFS, a tight integration of two earlier multi-core nested depth-first search (NDFS) algorithms for LTL model checking. CNDFS combines the different strengths and avoids some weaknesses of its predecessors. We compare CNDFS to an earlier ad-hoc combination of those two algorithms and show several benefits: It has shorter and simpler code and a simpler correctness proof. It exhibits more robust performance with similar scalability, while at the same time reducing memory requirements.

The algorithm has been implemented in the multi-core backend of the LTSMIN model checker, which is now benchmarked for the first time on a 48 core machine (previously 16). The experiments demonstrate better scalability than other parallel LTL model checking algorithms, but we also investigate apparent bottlenecks. Finally, we noticed that the multi-core NDFS algorithms produce shorter counterexamples, surprisingly often shorter than their BFS-based counterparts.

For the entire collection see [\[Zbl 1251.68006\]](#).

MSC:

[68Q60](#) Specification and verification (program logics, model checking, etc.)

Cited in **1** Document

Software:

[LTSmin](#); [DiVinE](#)

Full Text: [DOI](#)