Run-time Efficient State Compaction in SPIN

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July 1998

Abstract

SPIN's efficiency depends greatly on the technique used for the representation of states. A number of recent proposals for more compact representations reduce the memory requirements, but at considerable run-time costs. These methods could be used as alternatives when the standard state representation exhausts the memory, but this is exactly when the additional run-time overhead is least affordable.

We investigate a simple but effective compaction scheme that has almost no run-time penalty, and can be used in conjunction with SPIN's normal modes of operation. In this scheme, a state is stored using variable-radix encoding. We compare this idea to SPIN's standard state representation, describe how SPIN was modified to support it, and contrast it with other techniques proposed. Finally, we present experimental results to demonstrate that the new technique could be considered for the default technique in SPIN because the run-time overhead is negligible.