

Inspect: A Runtime Model Checker for Multithreaded C Programs

Yu Yang
Xiaofang Chen
Ganesh Gopalakrishnan

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School of Computing
University of Utah
Salt Lake City, UT 84112 USA

Abstract

We present *Inspect*, a runtime model checker for revealing concurrency bugs in multithreaded C programs. *Inspect* instruments a given program at all global interaction points, and with the help of a new scheduler, examines all relevant thread interleavings under dynamic partial order reduction (DPOR). While the ideas behind *Inspect* are well known, there hasn't been a previously reported effort in which these ideas are applied to multithreaded C programs. We report on our engineering efforts to endow *Inspect* with (i) automatic source program instrumentation, (ii) practical DPOR implementation, and (iii) optimizations such as using locksets to compute more precise co-enabled relation. Our initial experience shows that such a tool can, indeed, be very effective for obtaining a handle on the notorious complexity of thread programming.