Multi-threaded programs are becoming more common in order to exploit the additional processing power provided by modern computer systems. Unfortunately, parallel programming is difficult to get right. Program execution becomes non-deterministic and new types of faults arise. A substantial source of errors are data races, where the program state may become undefined due to concurrent accesses to shared memory locations. Data races are difficult to find, because the observed faulty behavior is often not directly related to the program location causing the fault. The author presents improvements on the runtime analysis of C++ programs based on the Eraser algorithm that lead to a drastic reduction of false warnings. This is achieved by taking the temporally ordering characteristic of operations on condition variables into account. The author has validated the method by applying it to industrial size C++ programs. He compares the runtime behavior and the memory requirement of the method to commercial tools. The results confirm that the method presented in this book is faster and needs less memory for moderate numbers of threads, while the fault detection ratio is comparable.

My Life As A Third Grade Vampire (My Life As A Third Grade...), Natural History of New York Volume 14, La piccola paziente: Niki e Jazmin (Volume 4) (Italian Edition), El camino mas corto (Primeros lectores), Yoga in the Jungle, Valentin Va a la Fruteria - Opuestos (Spanish Edition), Many Colors of Mother Goose, Progress in Physical Organic Chemistry, Volume 13 (v. 13),

Efficient On-the-Fly Data Race Detection in Multithreaded C++ On-the-fly detection of data races in OpenMP programs. In Proceedings of Runtime checking of multithreaded applications with visual threads. In Proceedings **Efficient on-the-fly data race detection in multithreaded C++ programs** Apr 12, 2017 Abstract. This paper presents PRORACE, a dynamic data race detector practical for only 2.6% overhead at runtime with 27.5% detection proba- bility with a sampling than ever in multithreaded software [15, 37]. They are a. **Software Engineering, Business Continuity, and Education: - Google Books Result** Oct 1, 1997 Eraser: a dynamic data race detector for multi-threaded programs . on Runtime verification, September 27-30, 2011, San Francisco, CA. **Formal Approaches to Software Testing and Runtime Verification: - Google Books Result** Jan 28, 2015 Eraser dynamically detects data races in multi-threaded programs. There are All previous dynamic race detection tools that we know of are based on this for verifying the correctness of multithreaded programs at runtime. **Efficient and precise datarace detection for multithreaded object** Eraser: A Dynamic Data Race Detector for Multi-Threaded Programs. Stefan Savage .. cludes calls to the Eraser runtime to implement the Lockset algorithm. **On-the-fly race detection in multi-threaded programs** Oct 31, 2012 Enforcing locking discipline using lockset algorithm during run time of a multithreaded program. 2. Can detect data race conditions even on **Efficient and Precise Datarace Detection for Multithreaded Object** ABSTRACT. Bugs due to data races in multithreaded programs often ex- .. lockset-based Java-runtime data race detector of Nishiyama suffers about 8x **Algorithms for Data-Race Detection in Multithreaded Programs** A datarace occurs in a multithreaded program when two threads The instrumentation and runtime detector phases guarantee the tible to data races. **ProRace: Practical Data Race Detection for Production Use - People** Eraser: A Dynamic Data Race Detector for Multithreaded Programs Static: performed at compile time or earlier Dynamic: runtime analysis Most current **Eraser: A Dynamic Data Race Detector for Multi-Threaded Programs** We present algorithms for detecting data races in programs written in the Cilk multi- . the nondeterministic runtime e ects of a race are hard to identifyand even **Eraser: a dynamic data race detector for multithreaded**

programs A datarace occurs in a multithreaded program when two threads The instrumentation and runtime detector phases guarantee the tible to data races. **Parallelizing Data Race Detection - Pervasive Computing Research** Abstract: Multithreaded programs are subject to data races. the false positive rate and the runtime overhead by applying race detection only on a subset of the **Eraser: A Dynamic Data Race Detector for Multithreaded Programs Parallel Data Race Detection for Task Parallel Programs with Locks** Mar 1, 2007 Data race detection is highly essential for debugging multithreaded Goldilocks: a race-aware Java runtime, Communications of the ACM, **Runtime Verification: Second international Conference, RV 2011, - Google Books Result** Detecting data races in multithreaded programs is a crucial part of debugging such programs, but traditional data race detectors are too slow to use routinely. This paper shows at runtime [20, 31]. Even enumerating the possible behaviors of. **Efficient and Precise Datarace Detection for Multithreaded Object** Dynamic detection of atomic-set-serializability violations. G., Sobalvarro, P., Anderson, T.: Eraser: a dynamic data race detector for multithreaded programs. **Eraser: A dynamic data race detector for multi-threaded programs** Banerjee, U., Bliss, B., Ma, Z., Petersen, P.: A theory of data race detection. In: PADTAD 2006, pp. checker for multithreaded programs. In: POPL 2004, pp. **Combining Unit Tests for Data Race Detection - IEEE Xplore** Jun 17, 2002 Brad Richards , James R. Larus, Protocol-based data-race detection, Runtime race detection for multi-threaded C++ server applications, **Electronics, Communications and Networks IV: Proceedings of the - Google Books Result** Jul 20, 2008 On-the-fly race detection in multi-threaded programs . demonstrate a significant reduction in false alarms at a moderate runtime increase. . Hiroyasu Nishiyama, Detecting data races using dynamic escape analysis based **Efficient Detection of Data Race Conditions via - EECS @ UMich** tion that object-oriented programs provide guarantees about data runtime: First, object race detection checks if access to shared objects follows a locking dis-. Eraser: A Dynamic Data Race Detector for Multi-Threaded Programs. Stefan Savage .. cludes calls to the Eraser runtime to implement the Lockset. algorithm. **efficient on-the-fly data race detection in multithreaded C++ programs** Feb 5, 2017 To detect data races that harm production systems, program However, sound and precise data race detection adds too much run-time overhead for use . Atomizer: A Dynamic Atomicity Checker for Multithreaded Programs. **Eraser: A Dynamic Data Race Detector for Multithreaded Programs** Jun 11, 2003 Data race detection is highly essential for debugging multithreaded . on Formal Approaches to Software Testing and Runtime Verification, **DYNAMIC DETECTION AND HEALING OF LOW LEVEL DATA RACES** Nov 13, 2016 plicitly specifies tasks and the task parallel runtime employs work Similar to multithreaded programs, data races in task parallel programs are. **Dynamic Data Race Detection** Runtime checking of multithreaded applications with visual threads. In SPIN 00: Workshop Eraser: A dynamic data race detector for multithreaded programs. **Lightweight data race detection for production runs** Digital Unix and used it to detect data races in a number of programs, ranging from .. includes calls to the Eraser runtime to implement the Lockset algorithm. **Runtime Verification: Third International Conference, RV 2012, - Google Books Result** Nov 1, 1997 Eraser: a dynamic data race detector for multithreaded programs .. RunAssert: a non-intrusive run-time assertion for parallel programs **Eraser: A Dynamic Data Race Detector for Multi-Threaded Programs** number of GPU cores employed for data race detection, GUARD is able to perform data T.: Eraser: A dynamic data race detector for multithreaded programs. **Eraser: a dynamic data race detector for multi-threaded programs** Data races are a common problem in concurrent programming. to detect low level data races in Java programs and heal them – all at run-time. Data races are difficult to find using traditional testing approaches because a multi-threaded. **Runtime Verification: 4th International Conference, RV 2013, - Google Books Result** Contrarily to other tools that detect typical concurrency bugs like data races or depth of event-driven programs in order to prevent stack overflows at

runtime on software instruction counter to record and replay multithreaded programs in the