A Case Study on Context Maintenance in Dynamic Hybrid Race Detectors

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G7315, 7th Floor, Green Zone  
Yeung Kin Man Academic Building  
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**Abstract**

Many dynamic hybrid race detectors aim at detecting violations of the lockset discipline in execution traces of multithreaded programs. They are designed to abstract memory accesses appearing in traces as contexts. Nonetheless, they keep these contexts in different extents and partition the sets of contexts into equivalent classes by different granularity. In our case study, we compare three detectors using the PARSEC benchmark suite to examine the impact of using unrestricted strategy or restricted strategy for keeping these contexts in sequence on detection effectiveness, and the impact of partitioning context sequences by different granularities on scalability in time cost. The case study results indicate that using restricted context sequences sufficed to detect very high proportions of locking discipline violations detectable by using unrestricted context sequences, and the partitioning of context sets into finer equivalent classes significantly lowers the scalability in time cost with increasing number of threads to handle the same input workload.

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Research Interests: Deterministic Replay; Data Races

All are welcome!