A Case Study on Context Maintenance in Dynamic Hybrid Race Detectors

SPEAKER **Mr Jialin YANG**

PhD Student
Department of Computer Science
City University of Hong Kong
Hong Kong

DATE 4 August 2017 (Friday)
TIME 3:00 pm - 3:30 pm

VENUE CS Seminar Room, Y6405
6th Floor, Yellow Zone
Yeung Kin Man Academic Building
City University of Hong Kong
83 Tat Chee Avenue
Kowloon Tong

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.

The paper was presented at the Software Test Automation (STA) workshop of the 41th IEEE International Conference on Computers, Software & Applications (COMPSAC 2017) held at Turin, Italy, 4-8 July, 2017.   The conference is sponsored by the IEEE Computer Society.

Supervisor: Dr W K Chan

Research Interest: Dynamic Analysis and Testing of Complex Software Applications.

All are welcome!