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Distinguished Speaker Series

Shan Lu

University of Wisconsin - Madison

Concurrency-bug detection, diagnosis, and fixing

Thursday, February 16, 2012

4 - 5 PM CST

3405 Siebel Center

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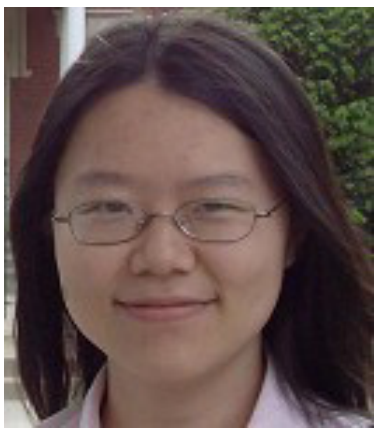

Abstract

Synchronization mistakes in multi-threaded software (i.e., concurrency bugs) are big threats to system reliability in the multi-core era. They are difficult to detect before code release because of the huge state space of multi-threaded software. Once released, they lead to non-deterministic production-run failures that are difficult to diagnose. When eventually detected, they cost a lot of manual effort to fix because of the inherent complexity of synchronization.

In this talk, I will describe our research on detecting, diagnosing, and fixing concurrency bugs. I will first present our effect-oriented concurrency-bug detection tools, ConMem and ConSeq. These tools identify potential failure sites in a program and look for suspicious interleavings that could lead to these failures. The unique effect-oriented perspective enables ConMem and ConSeq to detect concurrency bugs before they manifest with higher coverage and accuracy than traditional cause-oriented approaches. I will then briefly discuss our sampling-based production-run concurrency-bug failure diagnosis tool, CCI, and our automatic concurrency-bug fixing tool, AFix. I will conclude the talk by discussing other on-going research in my group.

Bio

Shan Lu is an Assistant Professor of Computer Sciences at University of Wisconsin, Madison.

She earned her Ph.D. at University of Illinois, Urbana-Champaign, in 2008, where she completed a thesis on “Understanding, Detecting, and Exposing Concurrency Bugs”.

At University of Wisconsin, her group works on detecting, diagnosing, and fixing concurrency bugs and performance bugs. Shan Lu won NSF Career Award in 2010. Her research group is currently supported by Claire Boothe Luce faculty fellowship and NSF grants.

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