

Department of Computer Science and Engineering

Presents the Faculty Candidate

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Failure Diagnosis with Better Logging Support

Computer systems often fail in production. As these failures directly affect the end users, large computer system vendors typically have to invest significant amounts of resources in trouble-shooting them. Unfortunately, diagnosing these production failures is notoriously difficult. Indeed, constrained with both privacy and expense reasons, software vendors often cannot reproduce such failures. Therefore, support engineers and developers continue to rely on the logs printed by the run time system to trouble-shoot the production failures. However, the ad-hoc nature of today's system logs are frequently insufficient for effective failure diagnosis.

In this talk, I will describe our work on improving the software logging for better production failure diagnosis. One approach, LogEnhancer, uses a novel combination of program analysis and system techniques to collect additional information for each existing log message. Another approach tackles the problem of "silent failures" --- failures without any log messages printed. We applied these approaches to a broad range of real software systems, and found that we can dramatically improve the postmortem failure diagnosis by improved software logging. The insights we learnt could also benefit programmers towards better designs of their software for better failure diagnosability.

BIO: Ding Yuan is a Ph.D. candidate in the University of Illinois at Urbana-Champaign. He is also a visiting student in the University of California at San Diego. His research interests span the areas of systems, software engineering and programming languages, with a focus on practical approaches for failure diagnosis. His research on failure diagnosis has been requested for production release by large vendors including Cisco, EMC, Huawei, NetApp, Qualcomm, etc. He has received two ASPLOS best paper nominees, an ACM SIGSOFT Distinguished Paper award, an Outstanding Teaching Assistant award, and a Saburo Muroga Fellowship.

Monday, February 20, 2012 @ 3:30 PM

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