



Presents the Spring 2014 EECS Seminar Series

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**“Detecting and Repairing Performance Bugs”
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ABSTRACT

Software bugs and ineffective testing cost the US economy tens of billions of dollars each year. My research develops novel software and hardware techniques for combating software bugs. My research so far focuses on two types of bugs: performance bugs and concurrency bugs.

In this talk, I will present Toddler and Lullaby, two novel techniques for automatically detecting and repairing performance bugs---programming mistakes that unnecessarily slow down program execution. Unlike profilers, which focus on methods that take a long time to execute, Toddler and Lullaby focus on code and execution patterns that are indicative of common programming mistakes affecting performance. The additional information provided by these patterns enable Toddler and Lullaby to have better results---more automation, fewer false negatives, fewer false positives, automated repair---than profilers for the bugs Toddler and Lullaby are designed to find. Toddler and Lullaby employ new dynamic and static analyses, respectively. Toddler and Lullaby found over 150 new performance bugs in widely used Java (Ant, Lucene, Google Core Libraries, Groovy, Tomcat, etc) and C/C++ applications (GCC, Google Chrome, Mozilla, MySQL). Over 100 of these bugs have already been fixed by developers.

BIOGRAPHY

Adrian Nistor is a Ph.D. candidate in the Computer Science Department at the University of Illinois at Urbana-Champaign. His research interests are in software engineering, with a focus on detecting, repairing, and preventing bugs in real-world applications. His work spans both software and hardware, e.g., he published in both ICSE and MICRO, and his techniques found new bugs that developers fixed in projects widely used in the software community (e.g., see above) and in the hardware community (e.g., PARSEC).