

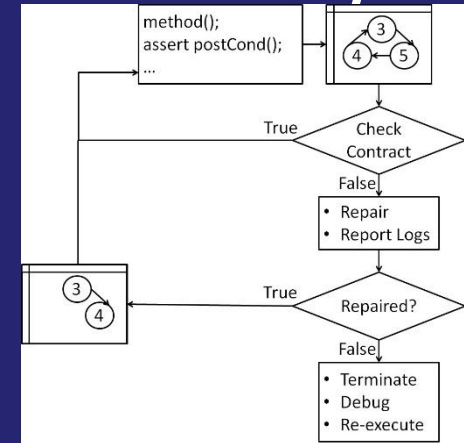
Contract-driven Data Structure Repair

Abstract

A large degree of research effort on increasing software reliability is dedicated to requirements, architecture, design, implementation and testing—activities that are performed before system deployment. While such approaches have become substantially more advanced, software remains buggy and failures remain expensive. We take a radically different approach to reliability from previous approaches, namely contract-driven data structure repair for runtime error recovery, where erroneous executions of deployed software are corrected on-the-fly using rich behavioral contracts. Our key insight is to transform the software contract which gives a high level description of the expected behavior—to an efficient implementation which repairs the erroneous data structures in the program state upon an error. To improve efficiency, scalability, and effectiveness of repair, in addition to rich behavioral contracts, we leverage the current erroneous state, dynamic behavior of the program, as well as repair history and abstraction.

Biography

Dr. Razieh Nokhbeh Zaem received the Bachelor of Science degree in Computer Engineering from Sharif University of Technology, Tehran, Iran in September 2006. In May 2010, she received the Master of Science and Engineering degree in Electrical and Computer Engineering from the University of Texas at Austin and was honored as a 2010 Google Anita Borg Scholarship Finalist. She interned at Rockwell Automation Inc. in Austin, TX in Summer 2010, and at Fujitsu Laboratories of America in Sunnyvale, CA in Summer and Fall 2012. She received her PhD in Electrical and Computer Engineering from the University of Texas at Austin in May 2014. She joined the Center for Identity at the University of Texas at Austin as a post doctoral fellow in 2014.



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