National Security Education Center

UNCLASSIFIED

Information Science and Technology Seminar Speaker Series

Cindy Rubio-Gonzalez
University of California, Davis

Scalable Program Analyses to Improve Software Reliability

Wednesday, June 24, 2015

3:00 - 4:00 PM

TA-3, Bldg. 1690, Room 102 (CNLS Conference Room)

Abstract: In this talk, I will present my work on developing and applying static program analyses to automatically find error-propagation bugs in large software systems. Bugs found in error handlers are among the most pervasive, dangerous, and difficult to detect in software systems. Incorrect error handling is a longstanding problem in many application domains, including systems software and user applications that use the return-code idiom. First, I will give an overview of an interprocedural context- and flow-sensitive analysis that tracks the propagation of error codes. This analysis is formalized using weighted pushdown systems (WPDS). I will describe how the analysis is used to find a variety of error-propagation bugs, such as dropped errors, and misused error-valued pointers. I will present results for numerous real-world Linux file systems such as ext3 and ReiserFS, and Linux device drivers where the analysis have found hundreds of confirmed error-propagation bugs. Last, I will talk about our recent work on database-backed program analysis for scalable error propagation.

Biography: Cindy Rubio-Gonzalez is an Assistant Professor of Computer Science at the University of California, Davis. Prior to that position, she was a Postdoctoral Researcher in the EECS Department at the University of California, Berkeley. She received her Ph.D. in Computer Science from the University of Wisconsin,ÄìMadison in 2012. Her work spans the areas of programming languages and software engineering, with a specific focus on program analysis. Her research aims to design and build tools to help developers write more reliable and efficient software. Cindy is a UC Davis CAMPOS Faculty Scholar, an AAUW International Doctoral Fellow, and a member of Latinas in Computing.

For more information contact the technical host Curt Canada, cvc@lanl.gov, 665-7453.

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