

Static and Dynamic Analyses of Programs with Implicit Control Flow

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Although object-oriented languages can improve programming practices, their characteristics may introduce new problems for software engineers. One important problem is the presence of implicit control flow caused by exception handling and polymorphism. Implicit control flow causes complex interactions in programs, and can thus complicate software-engineering tasks. In this talk, I will present an approach for supporting these tasks, based the static and dynamic analyses of constructs that cause implicit control flow. The approach provides software engineers with information for supporting and guiding development and maintenance tasks. In the talk, I will also present empirical results to illustrate the potential usefulness of the approach. The studies show that, for the subjects considered, complex implicit control flow is always present, causes coding patterns that are difficult to understand and maintain, and providing interactions that are not often well tested.

Mary Jean Harrold is the NSF ADVANCE Professor of Computing at Georgia Tech. Her research interests are in analysis and testing of large, evolving software systems, development of trustworthy software, fault-localization using statistical analysis and visualization, monitoring of deployed software to improve quality, and software self-awareness through real-time assessment and response. Professor Harrold is a recipient of the National Science Foundation's National Young Investigator Award and was named an ACM Fellow. She served on the editorial boards of IEEE Transactions on Software engineering and the Empirical Software Engineering Journal, and is currently serving on the editorial board of ACM Transactions on Programming Languages and Systems. She is a member of the Board of Directors for the Computing Research Association, and currently serves as Vice Chair of ACM SIGSOFT. She is serving as co-chair of the Computing Research Association's Committee on the Status of Women in Computing (CRA-W) and a member of the Leadership Team of the National Center for Women and Information Technology. She received the PhD from the University of Pittsburgh.