Supporting Software Development through Code History Analysis

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Abstract

Software developers spend large amounts of time trying to answer questions about the tasks that they need to perform. Some example questions are: “why was this code implemented in this way?” and “who has the most expertise about this functionality?”. The process of answering such questions not only decreases software development productivity, but it also decreases software quality, since developers may introduce bugs in the code as a consequence of incorrectly answering their questions. In my research, I follow the insight that many of the questions that developers ask can be answered automatically by analyzing the history of the source code of the program. Unfortunately, today's software development techniques and tools are not well suited for the easy and efficient procurement of code history information. Current revision control systems and research approaches lack functionality required for the study of code history, such as the study of multiple revisions, and the study of fine-grained code selections. In this talk, I present my novel technique, called History Slicing, that automates the multi-revision, fine-grained analysis of source code history. I also demonstrate how the use of my automatic History Slicing technique largely increased both the effectiveness and efficiency with which software developers could answer questions about multiple aspects of software development.

Speaker’s Biography

Francisco Servant is an assistant professor of Computer Science at Virginia Tech. His research seeks to provide practical and human-friendly techniques and tools that improve the effectiveness and efficiency of software development and maintenance tasks. His research interests include software development productivity, software quality, mining of software repositories, program comprehension, and software visualization. He has published articles in these areas at top conferences such as the International Conference on Software Engineering (ICSE), and the International Symposium on the Foundations of Software Engineering (FSE). He has also performed research for large technology companies, such as Microsoft Research and DreamWorks Animation. Francisco received a Ph.D. in Software Engineering from the University of California, Irvine, under the supervision of James A. Jones. He also holds a M.S. in Information and Computer Sciences from the same university, supervised by André van der Hoek. He received the B.S. in Computer Science from the University of Granada, Spain. More information about Francisco's research is available at http://www.fservant.com.