Abstract:
Since the advent of the World Wide Web in the early 1990’s, virtually every aspect of modern human life has been touched. Today, the number of Internet users continues to grow, and web applications have become an ever more pervasive and critical infrastructure for society and commerce around the globe. Along with this trend, the process of creating web pages has also become increasingly dynamic with flexible design and content, and different programming languages are involved to enable this process. While this is required to provide better experience to users and to meet business needs, it is making the applications a lot more difficult to write and maintain, as well as to prevent security breaches. In this talk, I will discuss the challenges in web application analysis and present my research to fill in this gap. Our goal is to develop an infrastructure for multi-language and cross-layer program analysis for dynamic web applications. I will be presenting the key techniques to enable this analysis including symbolic execution, variability-aware parsing, and embedded code analysis. Finally, I will describe various applications for web programs that can benefit from our framework such as web security, testing, bug detection, and software development support.

Bio:
Hung Nguyen is a Ph.D. candidate in the Electrical and Computer Engineering Department at Iowa State University. He joined the Ph.D. program at Iowa State University in 2009, after working as a project assistant at IBM Vietnam for one year. He received his B.S. degree in computer science from the College of Technology, Vietnam National University, Hanoi in 2008. His research areas include program analysis and software engineering. He has been developing analysis for multilingual, dynamic web applications via techniques such as symbolic execution, variability-aware execution, and variability-aware analysis. He has published more than 20 research papers at top-tier international conferences on software engineering.