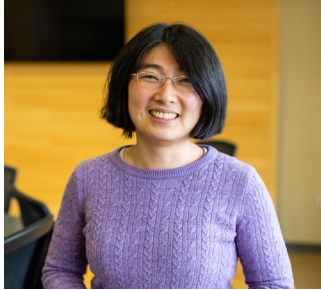


## Faculty Candidate Seminar – Software Engineering

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### Na Meng

Associate Professor, Dept. of Computer Science  
Virginia Tech

Thursday, January 19, 2023

Presentation: 10:45 A.M. – 11:45 A.M.

Reception: 11:45 A.M. – 12:15 P.M.

MSEE 112

## Investigating & Combating Software Complexity

**Abstract:** Software is widely used in almost every domain. When software applications contain defects or errors, these errors or software bugs can trigger security problems, cause financial loss, or even jeopardize human health. However, maintaining software to remove all those errors is usually challenging. This is because to resolve a software issue, developers usually spend lots of time and effort in order to comprehend programs, so that they can apply program changes consistently, completely, and correctly. When developers have insufficient domain knowledge or misunderstand the program logic, they may fail to fix the bug or their bug fixes can actually introduce new bugs.

In this talk, I will present our recent research that intends to bridge the gap between program complexity and developers' programming capabilities. There are three parts in my talk. For the first part, I will introduce BUCOND—a new tool that detects build conflicts in software merge for Java programs via static analysis. For the second part, I will introduce our recent empirical study on existing detectors of API misuse-related vulnerabilities. For the third part, I will introduce SoGen—a new tool that synthesizes solvers from problem specifications. All our empirical studies and techniques have the potential of helping developers (1) better understand program complexity and the complexity of software maintenance, and (2) improve program maintenance as well as software quality.

**Bio:** Na Meng has been an Associate Professor in the Department of Computer Science at Virginia Tech since 2021. She received her B.E. in Software Engineering from Northeastern University (NEU) in China in 2006, and received her M.S. in Computer Science from Peking University in China in 2009. She obtained her Ph.D. in Computer Science from The University of Texas at Austin in 2014, advised by [Miryung Kim](#) and [Kathryn S. McKinley](#). She started working in Virginia Tech as an Assistant Professor in 2015. Her research interests include Software Engineering, Programming Languages, Software Security, and Artificial Intelligence. Her research group NiSE (iNnovations in Software Engineering) conducts various empirical studies and proposes novel automatic approaches. Her research mission is to reveal unknown and interesting phenomena in current software practices, and to invent new tools that facilitate better software development and maintenance in the future. Dr. Meng received the NSF CAREER Award in 2019. Her research has been supported by NSF and ONR.