Keynote I

Conquering the Combinatorial Explosion:
Analyzing Variable Software

Sven Apel
University of Passau, Germany

Abstract
Variability is everywhere, and software is no exception: It is difficult to imagine any kind of non-trivial software system that is not variable or configurable. Beside immediate benefits, such as mass customization, variability introduces an additional dimension of complexity that poses new challenges for software engineering.

I will provide an overview of recent work on efficiently analyzing and understanding variable software systems. In particular, I will categorize and compare different strategies to incorporate variability during analysis and to conquer the combinatorial explosion of the configuration space. Furthermore, I will report on success stories of applying different kinds of analyses to variable software as well as on potential pitfalls. At the heart of the problem, I will relate issues of developing and analyzing variable software systems to the infamous feature-interaction problem and its importance for further developments in this area.

Speaker’s Bio
Sven Apel holds the Chair of Software Product Lines at the University of Passau, Germany. The chair is funded by the esteemed Emmy-Noether and Heisenberg Programmes of the German Research Foundation (DFG). Prof. Apel received his Ph.D. in Computer Science in 2007 from the University of Magdeburg, Germany. His research interests include novel programming paradigms, software engineering and product lines, and formal and empirical methods. He is the author or coauthor of over a hundred peer-reviewed scientific publications. Sven Apel is a member of the IFIP Working Group 2.11 (Program Generation), and serves regularly in program committees of highly ranked international conferences. His work received awards by the Ernst-Denert Foundation and the Karin-Witte Foundation.
Abstract
Ten years ago the architecture community started a fundamental paradigm shift by realizing that architecting goes far beyond “boxology”; it essentially concerns making design decisions. This sparked numerous research projects and brought hope in revolutionizing the practice of architecting. How far have we come, ten years down the road? Have we harnessed the potential of design decisions, reasoning and architecture knowledge management? What is the current state of research and practice in architecture knowledge? I will try to answer these questions by revisiting the research in the field and focusing on lessons learned and promising future directions.

Speaker’s Bio
Dr. Paris Avgeriou is Professor of Software Engineering in the Johann Bernoulli Institute for Mathematics and Computer Science, University of Groningen, the Netherlands where he has led the Software Engineering research group since September 2006. Before joining Groningen, he was a post-doctoral Fellow of the European Research Consortium for Informatics and Mathematics (ERCIM). He has participated in a number of national and European research projects directly related to the European industry of Software-intensive systems. He has co-organized several international conferences and workshops (mainly at the International Conference on Software Engineering - ICSE). He sits on the editorial board of Springer Transactions on Pattern Languages of Programming (TPLOP). He has edited special issues in IEEE Software, Elsevier Journal of Systems and Software and Springer TPLOP. He has published more than 110 peer-reviewed articles in international journals, conference proceedings and books. His research interests lie in the area of software architecture, with strong emphasis on architecture modeling, knowledge, evolution, patterns and link to requirements. He champions the evidence-based paradigm in Software Engineering research.