SPLC 2016
The 20th International Systems and Software Product Line Conference
September 19-23, 2016    Beijing, China

Program
Welcome Message

Welcome to SPLC 2016, the 20th International Systems and Software Product Line Conference. SPLC is the premier forum for practitioners, researchers and educators to present and discuss the most recent ideas, innovations, trends, experiences, and concerns in the area of software product lines, software product family engineering and, more in general, systems family engineering.

SPLC 2016 consists of a variety of exciting events, including keynotes, tutorials and paper presentations. This year, the conference consists of a broad combination of research, software industry, vision and system engineering papers and tool demos, as well as a doctoral symposium, workshops and tutorials. Totally, the conference received 79 paper submissions: 44 research papers, 8 software industry papers, 7 vision papers, 4 systems engineering papers and several tool demos and doctoral proposals. We would like to thank all authors for submitting papers.

Each submitted paper was reviewed by at least three Program Committee members. Based on the review reports and intensive discussions conducted electronically, the Program Committee selected 17 full papers and 5 short ones for the research track, 5 full papers and 1 short paper for the software industry track, one short paper for the vision track, 3 full papers for the systems engineering track, leaving us with a paper acceptance rate of 39%, 63%, 14% and 75%, respectively.

In addition, many recent excellent tools used in research and industry were shown in the tool demo track, and a great deal of new ideas were discussed at the doctoral symposium, workshops and tutorials.

We would like to thank our keynote speakers, Hans van Vliet, Tetsuo Tamai, Huaimin Wang, and Dayong Jiang for sharing their ideas and insights on this field. Also, we would like to thank the Program Committee members for their help in making the selection of the papers. We also would like to thank the members of the Organizing Committee whose efforts contributed to make the conference a success. Finally, we would like to thank our sponsors for their support and contributions.

Sincerely,

SPLC 2016 Organization Committee
Organization

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Keynotes

Keynote by Prof. Hans van Vliet,
VU University Amsterdam

Decision making in software architecture
Abstract:
Traditionally, software architecture is seen as the result of the software architecture design process, the solution, usually represented by a set of components and connectors. Recently, the why of the solution, the set of design decisions made by the software architect, is complementing or even replacing the solution-oriented definition of software architecture. This in turn leads to the study of the process of making these decisions. How do people take design decisions? Is that a rational process, whereby people choose the best option at each stage, or is the process a lot more flimsy? In this talk, I explore this and other questions about the nature of the software architecture design process. I also outline some research directions that may help us understand and improve the software architecture design process.

Bio:
Hans van Vliet is Professor in Software Engineering at the VU University Amsterdam, The Netherlands, since 1986. He got his PhD from the University of Amsterdam. His research interests include software architecture, knowledge management in software development, global software development, and empirical software engineering. Before joining the VU University, he worked as a researcher at the Centrum voor Wiskunde en Informatica (CWI, Amsterdam). He spent a year as a visiting researcher at the IBM Almaden Research Center in San Jose, California. He is the author of “Software Engineering: Principles and Practice”, published by Wiley (3rd Edition, 2008). He is a member of IFIP Working Group 2.10 on software architecture, and the Editor in Chief of the Journal of Systems and Software.

Keynote by Prof. Tetsuo Tamai,
Hosei University

Product-centered View vs Process-centered View
Abstract:
Looking back the history of software engineering, we can observe an alternating cycle of interest on product-centered view vs. process-centered view in software research and practices. From the late 1980’s to early 1990’s, software process became quite an active field. Activities concerning software process were hot in academia as well as in industry. The interest on software process saw its peak in early 1990’s but lost the momentum soon. Then came the fever on software architecture. The book “Software Architecture” by M. Shaw and D. Garlan was published in 1996 and widely read. Design patterns and application frameworks drew attention about the same time, which together indicate a shift of interest from process to product. In 2000’s, the interest on processes revived. One phenomenon is the upsurge of interest on the agile process. As software product lines (SPL) contains the word product in the term, it deals with a variety of products but its focus is also on the process of managing a collection of similar software production lines. In this talk, I’d like to give a perspective on the alternating cycle of interest on product-centered view vs. process-centered view and then characterize SPL in this framework.

Bio:
Tetsuo Tamai received the B.S., M.S. and Dr.S. degrees in mathematical engineering from the University of Tokyo. He joined Mitsubishi Research Institute, Inc. in April 1972 and had been the manager of Artificial Intelligence Technologies Section from October 1985 to March 1989. He became Associate Professor of Graduate School of Systems Management, the University of Tsukuba in 1989. He then became Professor of Graduate School of Arts and Sciences, the University of Tokyo in 1994. He retired from the University of Tokyo in March 2012 and moved to Faculty of Science and Engineering, Hosei University in April 2012. His current research includes requirements engineering, high reliability component-based software engineering, collaboration and role modelling, formal analysis of software architectures and software evolution process. He has been contributing to the activities of Japan Society for Software Science and Technology for a long time as a board member and as the Editor-in-Chief of its journal “Computer Software.” He served as the Program Chair of JSSST 20th anniversary conference in September 2003. He was an associate editor of ACM Transactions on Software Engineering and Methodology (TOSEM) in 2004-2008, an associated editor of IEEE Transactions on Software Engineering (TSE) in 2008-2013, and on the editorial board of Information and Software Technology (Elsevier) since 1995. He was a member of the executive committee of ACM SIGSOFT as an International Liaison from 2001 to 2008 and also a past chair of...
Special Interest Group on Software Engineering, Information Processing Society of Japan and a past chair of the Software Engineers Association, Japan. He has been sharing responsibilities of a number of international academic conferences, serving Program Committees of ICSE's, RE's, ESEC/FSE's, ICSM's and many others and Steering Committee of APSEC, ICFEM and IWPSE. In 2008, he was Program Chair of the 16th IEEE International Conference on Requirements Engineering held in Barcelona, Spain.

Keynote by Prof. Huaimin Wang, National University of Defense Technology

TRUSTIE: Towards Software Production based on Crowd wisdom
Abstract:
Software development is either creation activities that rely on developers’ creativity and talents, or manufacturing activities that follow the engineering processes. Engineering processes need to include creation activities to address tasks such as requirement elicitation and bug finding. On the other hand, by exploiting the crowd wisdom, open-source development demonstrated to be a suitable environment for software creation. However, it also has several limitations, such as guaranteeing the progress and quality of production process. This talk will introduce a software development platform and ecosystem that combines the strengths of the two models. First, we propose the Trustworthy Software Model as a basis to support such a hybrid development ecosystem. The core of this model contains a novel lifecycle model, an evidence model and an evolution model. Second, based on the model, we propose the Trustworthy Software Development and Evolution Service Model. It integrates from crowd collaboration, resource sharing, runtime monitoring, and trustworthiness analysis into an integrated framework. Based on this integrated model, we designed and implemented TRUSTIE, which enables crowd-oriented collaboration among internal development teams and the external crowds by combining the software creation and software manufacturing in one ecosystem.

Bio:
Huaimin Wang received his Ph.D. in Computer Science from National University of Defense Technology (NUDT). He is now a professor. His current research interests include distributed computing technologies and systems, crowd-based software engineering and trustworthy software. He has been awarded the “Chang Jiang Scholars Program” professor by Ministry of Education of China, the Distinct Young Scholar by the National Natural Science Foundation of China, the “Ten Thousand Talent Program”, and the fellow of China Computer Federation (CCF). He has worked as the director of National High Technology Research and Development Program of China, and chaired more than 20 research projects. He has published more than 200 research papers in international conferences and journals. He was program co-chair of COMPSAC’2003, SRDS’2006-2007, SOSE’2013, /VCE’2009-2013, CNCC’2013, and invited to give keynotes in many important conferences and forums. He was on the Editorial Board of Journal of Software, Science Communications, Journal of Computer Science and Technology, Journal of Computer Research and Development.

Keynote by Dayong Jiang, Vice President of IT R&D Dept, Huawei Technologies Co. Ltd.

Software Development Trend and Practice in the Cloud Era
Abstract:
Now we are in the cloud era. The cloud architecture fully supports the digital transformation of all industry. Software development faces new challenges, such as business agility requirements (weeks level), the sharp increase in the scale of software source code (tens of millions of rows), ecological management issues, compatibility issues of open source, etc. How to enhance the efficiency of software development and tools enablement, it will be a challenge to products and solutions providers. Huawei will share how to innovate and practices in these technology trends.

Bio:
Mr Jiang joined Huawei in 1999 and have been worked in the R&D area for 16 years. He involved in and was responsible for the products & solutions of telecommunications and information and technology, such as A8010, UMG8900, DC² and so on. He was in charge of R&D projects that thousands of people involved in per month. He has played a role of engineer, project manager, test manager, project leader, line manager, product development unit director, develop unit manager, quality director, VP of R&D and so on. And he has an understanding of quality management, project management, team management and R&D model.
Conference Program

**Monday, September 19th**

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| 9:00-12:00 | REVE workshop (Room 5)  
Tutorial 1: Managing requirements in product lines (Room 1)  
Darilo Beuche |
| 12:00-14:00 | Lunch (Restaurant, Ground Floor; Friendship Palace) |
| 14:00-17:00 | REVE workshop (Room 5)  
Tutorial 2: Leveraging model driven engineering in software product line architectures (Room 1)  
Bruce Trask |

**Tuesday, September 20th**

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<th>Time</th>
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| 9:00-12:00 | Tutorial 3: EASY-Produce: From product lines to variability-rich software ecosystems (Room 1)  
Klaus Schmid  
Tutorial 4: Software reuse and reusability based on requirements: product lines, cases and feature-similarity models (Room 5)  
Mike Mannion  
Doctoral Symposium (Room 3)  
| 12:00-14:00 | Lunch (Restaurant, Ground Floor; Friendship Palace) |
| 14:00-17:00 | Tutorial 3: EASY-Produce: from product lines to variability-rich software ecosystems (Room 1)  
Schmid, Eichelberger  
Tutorial 5: Clean Your Variable Code with FeatureIDE (Room 5)  
Thomas Thüm |

**Wednesday, September 21st**

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<th>Time</th>
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| 8:30-9:00 | Opening speech by the general chair (Room 5)  
Joint speech by the main track chairs (Room 5) |
| 9:00-10:20 | Keynote 1: Decision making in software architecture (Room 5)  
Hans van Vliet  
Chair: Rick Rabiser |
| 9:00-10:40 | Coffee Break |
| 10:40-12:00 | Keynote 2: Software Development Trend and Practice in the Cloud Era (Room 5)  
Dayong Jiang  
Chair: Bing Xie |
| 12:00-14:00 | Lunch (Restaurant, Ground Floor; Friendship Palace) |
| 14:00-15:30 | Session 1: Empirical Studies (Room 5)  
Chair: Holger Eichelberger  
3. Li Li,Abier Martinez, Tevfik Ziad, Tegawend F. Bissyand, Jacques Klein and Yves Le Traon. Mining Families of Android Applications for Extractive SPL Adoption. |
| 15:30-16:00 | Coffee Break |
| 16:00-17:30 | Session 2: Industrial Applications (Room 2+Room 3)  
Chair: Rick Rabiser  
1. Philipp Kehrbusch, Johannes Richenhagen, Bernhard Rumpe, Axel Schloßer, Christoph Schulze. Interface-Based Similarity Analysis of Software Components for the Automotive Industry.  
3. Danilo Beuche, Michael Schulze, Maurice Duvigneau. When 150% Is To Much: Supporting Product Centric Viewpoints In An Industrial Product Line. |
Session 3: Variability Modeling and Management (Room 2+Room 3)
Chair: Li Zhang

Session 4: Maintenance and Evolution (Room 5)
Chair: Daniela Rabiser

17:45- Reception (Restaurant, Ground Floor, Friendship Palace)

Thursday, September 22nd

9:00-10:20
Keynote 3: TRUSTIE: Towards Software Production based on Crowd wisdom
Huaimin Wang
Chair: Christoph Elsner

10:20-10:40
Coffee Break

10:40-12:00
Keynote 4: Product-centered View vs Process-centered View (Room 5)
Tesuo Tamai
Chair: Yun Xie

12:00-14:00
Lunch (Restaurant, Ground Floor, Friendship Palace)

Session 5: Analysis (Room 2+Room 3)
Chair: David Benavides
1. Rafael Olaechea, Uli Fahrenberg, Joanne Atlee, Axel Legay. Long-Term Average Cost in Featured Transition Systems.

14:00-15:30
Session 6: Software Quality Assurance (Room 5)
Chair: Yingfei Xiong

15:30-16:00
Coffee Break
### Session 7: Reuse (Room 2+Room 3)
Chair: Tomi Männistö

### Session 8: Industrial Lessons (Room 5)
Chair: Bo Zhang

### Banquet (Huajiayiyuan, Yuan Ming Yuan)
18:00-

### Session 9: Architectural Analysis (Room 5)
Chair: Dimitri Van Landuyt

### Demonstration Track (Room 1)
1. Tristan Pföwe, Thomas Thuem, Sandro Schulze, Wolfream Fenske, Ina Schaefer. Synchronizing Software Variants with VariantSync.

### VPLC 2016 Banquet
Huajiayiyuan, Yuan Ming Yuan

### Session 10: Variability Modeling II (Room 5)
Chair: Georg Buchgeher
3. Holger Eichelberger, Cui Qin, Roman Sizonenko, Klaus Schmid. Using IVML to model the topology of Big Data Processing Pipelines.

### Demonstration Track (Room 1)
Flexible time slot for demonstrations

### Closing (Room 5)
Handover to SPLC 2017 (Room 5)
Location

Meeting Room Information

1. Reception/Lunch             2. Conference venue

Meeting Room Information

Building 8 Level 1

Meeting Room 5
Meeting Room 3
Meeting Room 2
Meeting Room 1
VIP Room
Register
Beijing

Beijing, the capital of China, is the political, cultural, domestic and international communication center of China, and is a famous, ancient historical and cultural city in the world. In 1040 B.C., Beijing was built in the current Guang’an Men, Xuanwu District, so it has cover three thousand years history. In 938 A.D., the kingdom of Liao, which regions over north China, takes Beijing (called Yanjing at that time) as the provisional capital; Beijing capital of Yuan, Ming, Qing Dynasty, Beijing has over eight hundred and fifty years history as the capital.

The long history endows Beijing with rich and intensive culture and numerous historical relics. The well-known scenic spots and historical sites are the Palace Museum (the most complex of palace in wooden structure), the elegant and magnificent Temple of Heaven, the fairyland Beihai in the real life, Guozijian, the Imperial College (the highest institution in the Yuan, Ming, and Qing Dynasty), Prince Gong’s Mansion with the life track of the royal families and nobles.

The Charm of Beijing also lies in the dense and particular cultural atmosphere. The Beijing-style culture takes in every other culture to become colorful and intensive. The Charm and characteristics of Beijing are shown everywhere, including Hutong, Courtyard Houses, the Culture Street; Beijing Opera, folk arts, folk craft; food with Beijing flavor, century-old restaurant, etc. The Continuous development of CBD, the construction of the new scenes, the buildings of large business, entertainment, and consumption centers in line with the international practice enrich Beijing with flourishing and modern international flavor.

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