



# ASE2006

## 21st IEEE/ACM International Conference on Automated Software Engineering

September 18-22, 2006

Tokyo, JAPAN



# Final Program



TOSHIBA INFORMATION SYSTEMS(JAPAN) CORPORATION

ASE2006 is held in cooperation with Information Processing Society of Japan

## Welcome to ASE2006 in Tokyo (東京へようこそ)

Welcome to Tokyo and the 21st IEEE/ACM International Conference on Automated Software Engineering. This year the conference is being held for the first time in Asia and we are fortunate to have it in Japan.

The papers appearing in these proceedings were subjected to a rigorous and highly selective reviewing process. A total of 121 papers were submitted to the conference. Each paper was reviewed by at least 3 reviewers from the the Program Committee and Expert Reviewer Panel. The committee accepted 22 papers for presentation as talks and publication as full papers, and 17 for presentation as posters and publication as short papers.

In addition to the technical papers, the conference includes a doctoral symposium, tool demonstrations and tutorials. Several workshops are also co-located with ASE 2006, including: the 2nd Asian Workshop on Aspect-Oriented Software Development (AOAsia), the 2nd Workshop on Supporting Knowledge Collaboration in Software Development, the Japanese Workshop on Leveraging Web2.0 Technologies in Software Development Environments (WebSDE), and the Japanese Workshop on Requirements Engineering Tools (JWRET).

Finally, we hope you will also take the time to enjoy the diverse landscape, numerous sights, and excellent tourist facilities Japan has to offer.

Shinichi Honiden  
*General Chair*

Sebastian Uchitel and Steve Easterbrook  
*Program Committee Co-Chairs*

## Conference Committees

General Chair	Shinichi Honiden, National Institute of Informatics, Japan
Program Committee Co-Chairs	Sebastian Uchitel, Imperial College London, UK/ University of Buenos Aires, Argentina
	Steve Easterbrook, University of Toronto, Canada
Workshops Co-Chairs	Kathi Fisler, Worcester Polytechnic Institute, USA
	Hironori Washizaki, National Institute of Informatics, Japan
Tutorials Co-Chairs	Andrew Ireland, Heriot-Watt University, UK
	Katsuhisa Maruyama, Ritsumeikan University, Japan
Doctoral Symposium Co-Chairs	Alexander Egyed, Teknowledge Corporation, USA
	Bernd Fischer, University of Southampton, UK
Demonstrations Co-Chairs	Nicolás Kicillof, University of Buenos Aires, Argentina
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Financial Chair	Nobukazu Yoshioka, National Institute of Informatics, Japan
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Student Volunteer Co-Chairs	Fuyuki Ishikawa, National Institute of Informatics, Japan
	Kazutaka Matsuzaki, National Institute of Informatics, Japan

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Steering Committee Chair:

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Virginie Wiels, ONERA, CERT, France  
Kurt Stirewalt, Michigan State University, USA  
Andrea Zisman, City University London, UK  
Tom Ellman, Vassar College, USA

## Program Committee

Program Committee Co-Chairs:

Sebastian Uchitel, Imperial College London, UK/ University of Buenos Aires, Argentina

Steve Easterbrook, University of Toronto, Canada

Perry Alexander, University of Kansas, USA  
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Michael Godfrey, University of Waterloo, Canada  
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Hironori Washizaki, National Institute of Informatics, Japan  
Tao Xie, North Carolina State University, USA  
Andrea Zisman, City University London, UK

## Expert Reviewer Panel

Members of the Program Committee and:

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Mats Heimdahl, University of Minnesota, USA  
Shing-Chi Cheung, Hong Kong University of Science and Technology, China

Yves Ledru, LSR/IMAG, France

Bashar Nuseibeh, The Open University, UK  
Elisabetta Di Nitto, Politecnico di Milano, Italy  
Gerald Gannod, Arizona State University, USA  
Kamiya Toshihiro, National Institute of Advanced Industrial Science and Technology, Japan  
Nenad Medvidovic, University of Southern California, USA  
Wolfgang Emmerich, UCL, UK

## Program at a Glance

		September 18 <sup>th</sup> Monday		September 19 <sup>th</sup> Tuesday					
9:00 10:30	CR 103 Doctoral Symposium	Workshops				CR 102 Tutorial 1 Willem Visser	CR 103 Tutorial 2 Stephan Diehl		
		CR 1 W1 AOAisa	CR 2 W2 KCSD	CR 3 W3 WebSDE	CR 4 W4 JWRET				
10:30 11:00	Refreshment Break	Refreshment Break				Refreshment Break			
11:00 12:30 (13:00)	CR 103 Doctoral Symposium	Workshops				CR 102 Tutorial 1 Willem Visser	CR 103 Tutorial 2 Stephan Diehl		
		CR 1 W1 AOAisa	CR 2 W2 KCSD	CR 3 W3 WebSDE	CR 4 W4 JWRET				
12:30 14:00	Lunch Break	Lunch Break				Lunch Break (13:00–14:00)			
14:00 15:30	CR 103 Doctoral Symposium	Workshops				CR 102 Tutorial 3 Cyrille Artho	CR 103 Tutorial 4 Sophie Ramel Michael Schmitt		
		CR 1 W1 AOAisa	CR 2 W2 KCSD	CR 3 W3 WebSDE	CR 4 W4 JWRET				
15:30 16:00	Refreshment Break	Refreshment Break				Refreshment Break			
16:00 17:30 (18:00)	CR 103 Doctoral Symposium	Workshops				CR 102 Tutorial 3 Cyrille Artho	CR 103 Tutorial 4 Sophie Ramel Michael Schmitt		
		CR 1 W1 AOAisa	CR 2 W2 KCSD	CR 3 W3 WebSDE	CR 4 W4 JWRET				
		September 20 <sup>th</sup> Wednesday		September 21 <sup>st</sup> Thursday		September 22 <sup>nd</sup> Friday			
9:00 10:30	Hitotsubashi Memorial Hall Opening Ceremony		Hitotsubashi Memorial Hall		CR 1 & CR 2 Tool Demos	CR 3 & CR 4 Technical papers Management (full:3)			
	Keynote 1 Kokichi Futatsugi <small>Verifying Specifications with Proof Scores in CafeOBJ</small>		Keynote 2 Sebastian Thrun <small>Winning the DARPA Grand Challenge</small>						
10:30 11:00	Refreshment Break		Refreshment Break		Refreshment Break				
11:00 12:30	CR 1 & CR 2 Technical papers Modeling & Synthesis (full:2, short:4)	CR 3 & CR 4 Tool Demos	CR 1 & CR 2 Technical papers Analysis I (full:3)	CR 3 & CR 4 Technical papers Traceability (full:2, short:4)	CR 1 & CR 2 Panel ASE Retrospective	CR 3 & CR 4 Technical papers Mining Software Repositories (full:3)			
12:30 14:00	Lunch Break		Lunch Break		Lunch Break				
14:00 15:30	CR 1 & CR 2 Technical papers Architecture (full:2, short:3)	CR 3 & CR 4 Minitutorial Domain-specific Model Checking Using The Bogor Framework	CR 1 & CR 2 Technical papers Analysis II (full:3)	Hitotsubashi MH Minitutorial Testing Tools and Techniques: Evaluation Methods for ASE	Hitotsubashi Memorial Hall  Keynote 3 Sriram Rajamani <small>Automatic Property Checking for Software</small>				
15:30 16:00	Refreshment Break				Closing Ceremony				
16:00 17:30	CR 1 & CR 2 Technical papers Testing (full:2, short:3)	CR 3 & CR 4 Technical papers Impact analysis (full:2, short:3)	CR 3 & CR 4 Poster & tool Demos  (with Refreshments)		Acronym CR = Conference Room MH = Memorial Hall SCM = Steering Committee Meeting				
18:00 20:00	Josui Kaikan Reception	19:00 21:00 CR 1 SCM	19:00 21:00	Happo-en Banquet & Awards					

Corporate Exhibition(CR102):Sep20 10:30 - 16:00, Sep21 10:30 - 15:30, Sep22 10:30 - 14:00

## KEYNOTES

### Keynote 1: Wednesday, Sep 20, 9:00-10:30

#### Verifying Specifications with Proof Scores in CafeOBJ

**Kokichi Futatsugi, Graduate School of Information Science, JAIST (Japan Advanced Institute of Science and Technology), Nomi, Ishikawa, Japan**

*Verifying specifications is still one of the most important undeveloped topics in software engineering. It is important because quite a few critical bugs are caused at the level of domains, requirements, and/or designs. It is also important for the cases where no program codes are generated and specifications are analyzed and verified only for justifying models of problems in real world. In this talk, a survey of our research activities in verifying specifications is given. After explaining fundamental issues and importance of verifying specifications, the proof score approach in CafeOBJ and its applications to several areas are described.*



**Kokichi Futatsugi** is a professor of Graduate School of Information Science, JAIST (Japan Advanced Institute of Science and Technology), Ishikawa, Japan. His research interest includes formal methods, software requirements and specifications, modeling and specification languages. An important part of his research activities is done around the CafeOBJ formal specification language ([www.ldl.jaist.ac.jp/cafeobj](http://www.ldl.jaist.ac.jp/cafeobj)). CafeOBJ is an executable formal specification language which has been designed and developed by an international team headed by Prof. Futatsugi. He was a co-chair of the program committee of 20th ICSE (1998) and an associate editor of ACM TOSEM for 1995-2002. He is a member of the advisory board of Journal of Higher-Order and Symbolic Computation ([www.wkap.nl/journals/hosc](http://www.wkap.nl/journals/hosc)), and the editorial board of Journal of Object Technology ([www.jot.fm](http://www.jot.fm)) and Journal of Applied Logic ([www.elsevier.com/locate/jal](http://www.elsevier.com/locate/jal)).

### Keynote 2: Thursday, Sep 21, 9:00-10:30

#### Winning the DARPA Grand Challenge: A Robot Race through the Mojave Desert

**Sebastian Thrun, Computer Science Department, Stanford University**

*The DARPA Grand Challenge was the most significant event in the field of robotics in more than a decade. A mobile ground robot had to traverse 132 miles of punishing desert terrain in less than ten hours. In 2004, the best robot only made 7.3 miles. A year later, Stanford won this historical challenge and cashed the \$2M prize. This talk, delivered by the leader of the Stanford Racing Team, will provide insights into the software architecture of Stanford's winning robot "Stanley." The robot heavily relied on advanced artificial intelligence, and it used a pipelining architecture to turn sensor data into vehicle controls. The talk will introduce the audience into the fascinating world of autonomous robotics, share many of the race insights, and discuss some of the implications for the future of our society.*



**Sebastian Thrun** is widely considered a leading expert on robotics and artificial intelligence. Thrun is Associate Professor of Computer Science and Director of the Stanford Artificial Intelligence Laboratory (SAIL). Prior to winning the Grand Challenge, Thrun published seven books, 300 refereed papers, won numerous best paper awards, and served as PI on 6 major DARPA initiatives. His most recent book "Probabilistic Robotics" summarizes research on a new programming methodology for robots that has become mainstream in the field of robotics, with hundreds of papers published every year.



# CONFERENCE PROGRAM

## Wednesday, September 20th

### 9:00 (Hitotsubashi Memorial Hall) Opening Ceremony

#### Keynote

Verifying Specifications with Proof Scores in CafeOBJ  
*Kokichi Futatsugi, Graduate School of Information Science, JAIST (Japan Advanced Institute of Science and Technology), Nomi, Ishikawa, Japan*

### 10:30 Refreshment break

### 11:00 (Conference Rooms 1 & 2) Technical Papers: Modeling and Synthesis

Session chair: *Andrew Ireland*

Automated Information Aggregation for Scaling Scale-Resistant Services  
*Philip Gross and Gail Kaiser*

Generating Domain-Specific Visual Language Editors from High-level Tool Specifications  
*John Grundy, John Hosking, Nianping Zhu, and Na Liu*

(Short paper) From Capability Specifications to Code for Multi-Agent Software  
*Loris Penserini, Anna Perini, Angelo Susi, and John Mylopoulos*

(Short paper) An Instant Message-Driven User Interface Framework for Thin Client Applications  
*Matthias Book, Volker Gruhn, and Gerald Mücke*

(Short paper) Using Communicative Acts in Interaction Design Specifications for Automated Synthesis of User Interfaces  
*Jürgen Falb, Thomas Röck, Edin Arnautovic, Roman Popp, Helmut Jelinek, and Hermann Kaindl*

(Short paper) Annotation Inference for the Safety Certification of Automatically Generated Code  
*Ewen Denney and Bernd Fischer*

### 11:00 (Conference Rooms 3 & 4) Formal Tool Demos I

Session Chair: *Yves Ledru*

LSS: A Tool for Large Scale Scenarios  
*Robert J. Hall*

TOPCASED - Combining Formal Methods with Model-Driven Engineering  
*Nadège Pontisso and David Chemouil*

UML-based Service Discovery Tool  
*George Spanoudakis and Andrea Zisman*

Model-driven Monitoring: Generating Assertions from Visual Contracts  
*Marc Lohmann, Gregor Engels, and Stefan Sauer*

### 12:30 Lunch

### 14:00 (Conference Rooms 1 & 2) Technical Papers: Architecture

Session Chair: *Paul Grünbacher*

An Automated Formal Approach to Managing Dynamic Reconfiguration  
*Ian Warren, Jing Sun, Sanjev Krishnamohan, and Thiranjith Weerasinghe*

Differencing and Merging of Architectural Views  
*Marwan Abi-Antoun, Jonathan Aldrich, Nagi Nahas, Bradley Schmerl, and David Garlan*

(Short paper) Human-Friendly Line Routing for Hierarchical Diagrams  
*Tobias Reinhard, Christian Seybold, Silvio Meier, Martin Glinz, and Nancy Merlo-Schett*

(Short paper) Contradiction Finding and Minimal Recovery for UML Class Diagrams  
*Ken Satoh, Ken Kaneiwa, and Takeaki Uno*

(Short paper) Programming Language Inherent Support for Constrained XML Schema Definition Data Types and OWL DL  
*Alexander Paar and Walter F. Tichy*

### 14:00 (Conference Rooms 3 & 4) Minitutorial

Session Chair: *Sebastian Uchitel*

Domain-specific Model Checking Using The Bogor Framework  
*Robby*

### 15:30 Refreshment break

### 16:00 (Conference Rooms 1 & 2) Technical Papers: Testing

Session Chair: *Willem Visser*

An Empirical Comparison of Automated Generation and Classification Techniques for Object-Oriented Unit Testing  
*Marcelo d'Amorim, Carlos Pacheco, Tao Xie, Darko Marinov, and Michael Ernst*

Command-Form Coverage for Testing Database Applications  
*William G.J. Halfond and Alessandro Orso*

(Short paper) A Methodology for Automated Test Generation Guided by Functional Coverage Constraints at Specification Level  
*Odile Laurent, Christel Seguin, and Virginie Wiels*

(Short paper) An Automated Approach for Goal-driven, Specification-based Testing  
*Kristina Winbladh, Thomas A. Alspaugh, Hadar Ziv, and Debra J. Richardson*

(Short paper) Effective Generation of Interface Robustness Properties for Static Analysis  
*Mithun Acharya, Tanu Sharma, Jun Xu, and Tao Xie*

**16:00 (Conference Rooms 3 & 4) Technical Papers: Impact Analysis**  
Session Chair: *Bernd Fischer*

Automatic Identification of Bug-Introducing Changes  
*Sunghun Kim, Thomas Zimmermann, Kai Pan, and E. James Whitehead, Jr.*

Modularity Analysis of Logical Design Models  
*Yuanfang Cai and Kevin J. Sullivan*

(Short paper) Automatic Generation of Detection Algorithms for Design Defects  
*Naouel Moha, Yann-Gaël Guéhéneuc, and Pierre Leduc*

(Short paper) Automated Reasoning on Aspects Interactions  
*Paolo Falcarin and Marco Torchiano*

(Short paper) Detecting Precedence-Related Advice Interference  
*Maximilian Stoerzer, Robin Sterr, and Florian Forster*

**18:00-20:00 (Josui Kaikan) Reception**

**19:00-21:00 (Conference Room 1) Steering Committee Meeting**



## Thursday, September 21st

### 9:00 (Hitotsubashi Memorial Hall) Keynote

Winning the DARPA Grand Challenge: A Robot Race through the Mojave Desert  
*Sebastian Thrun, Computer Science Department, Stanford University*

### 10:30 Refreshment break

### 11:00 (Conference Rooms 1 & 2) Technical Papers: Analysis I

Session Chair: *Tetsuo Tamai*

A Portable Compiler-Integrated Approach to Permanent Checking  
*Nic Volanschi*

Integrating and Scheduling an Open Set of Static Analyses  
*Michael Eichberg, Mira Mezini, Sven Kloppenburg, Klaus Ostermann, and Benjamin Rank*

Reverse Engineering of Design Patterns from Java Source Code  
*Nija Shi and Ronald A. Olsson*

### 11:00 (Conference Rooms 3 & 4) Technical Papers: Traceability

Session Chair: *Michael Goedicke*

ArchTrace: Policy-Based Support for Managing Evolving Architecture-to-Implementation Traceability Links  
*Leonardo G. P. Murta, Andre Van Der Hoek, and Claudia M. L. Werner*

Automating Software Traceability in Very Small Companies: A Case Study and Lessons Learned  
*Christian Neumueller and Paul Grünbacher*

(Short paper) Automatic Round-trip Software Engineering in Aspect Weaving Systems  
*Mikhail Chalabine, Christoph Kessler, and Peter Bunus*

(Short paper) Towards Automatic Assertion Refinement for Separation Logic  
*Andrew Ireland*

(Short paper) Software Library Usage Pattern Extraction Using a Software Model Checker  
*Chang Liu, En Ye, and Debra J. Richardson*

(Short paper) A Unified Model for Product Data Management and Software Configuration Management  
*Tien N. Nguyen*

### 12:30 Lunch

### 14:00 (Conference Rooms 1 & 2) Technical Papers: Analysis II

Session Chair: *Virginie Wiels*

Bogor/Kiasan: A k-bounded Symbolic Execution for Checking Strong Heap Properties of Open Systems  
*Xianghua Deng, Jooyong Lee, and Robby*

Security Analysis of Crypto-based Java Programs using Automated Theorem Provers  
*Jan Jürjens*

Accurate Centralization for Applying Model Checking on Networked Applications  
*Cyrille Artho and Pierre-Loïc Garoche*

### 14:00 (Hitotsubashi Memorial Hall) Minitutorial

Session Chair: *Steve Easterbrook*

Testing Tools and Techniques: A Mini-Tutorial on Evaluation Methods for ASE  
*Janice Singer*

### 15:30 (Conference Rooms 3 & 4) Poster & Tool Demo Session and Refreshments

### 19:00-21:00 (Happo-en) Banquet & Best Paper Awards

## Friday, September 22nd

### **9:00 (Conference Rooms 1 & 2) Formal Tool Demos II**

Session Chair: *Bob Hall*

A New Web Browser Including a Transferable Function to Ajax Codes

*Noriko Hanakawa and Nao Ikemiya*

Automated Verification Tool for DHTML

*Takaaki Tateishi, Hisashi Miyashita, Kouichi Ono, and Shin Saito*

Mock-Object Generation with Behavior

*Nikolai Tillmann and Wolfram Schulte*

Tobias-Z: An Executable Formal Specification Of a Test Generator

*Yves Ledru and Lydie du Bousquet*

The Rearranger - A New Assembler Utility

*Ward Douglas Maurer*

### **9:00 (Conference Rooms 3 & 4) Technical Papers: Management**

Session Chair: *Yunwen Ye*

Using Decision Trees to Predict the Certification Result of a Build

*Ahmed E. Hassan and Ken Zhang*

Managing the Complexity of Large Free and Open Source Package-Based Software Distributions

*Fabio Mancinelli, Jaap Boender, Roberto di Cosmo, Jérôme Vouillon, Berke Durak, Xavier Leroy and Ralf Treinen*

Concurrent Engineering Support in Software Engineering

*Jacky Estublier and Sergio Garcia*

### **10:30 Refreshment break**

### **11:00 (Conference Rooms 1 & 2) Panel**

ASE Retrospective - What makes a good ASE paper

Session Chair: *Michael Lowry*

### **11:00 (Conference Rooms 3 & 4) Technical Papers: Mining Software Repositories**

Session chair: *Alessandro Orso*

Mining Aspects from Version History

*Silvia Breu and Thomas Zimmermann*

Identifying Refactorings from Source-Code Changes

*Peter Weißgerber and Stephan Diehl*

Sieve: A Tool for Automatically Detecting Variations across Program Versions

*Murali Krishna Ramanathan, Ananth Grama, and Suresh Jagannathan*

### **12:30 Lunch**

### **14:00 (Hitotsubashi Memorial Hall) Keynote**

Automatic Property Checking for Software: Past, Present and Future

*Sriram Rajamani - Microsoft Research India*

### **15:30 (Hitotsubashi Memorial Hall) Closing Ceremony**

## Workshops

### W1: 2nd Asian Workshop on Aspect-Oriented Software Development (AOAsia)

Date: September 19, 9:00 - 17:30

Room: Conference room 1 (2F)

#### Organizers:

*Elisa Baniassad, Chinese University of Hong Kong  
Kung Chen, National Chengchi University, Taiwan  
Shigeru Chiba, Tokyo Institute of Technology  
Jan Hannemann, University of Tokyo  
Hidehiko Masuhara, University of Tokyo  
Shangping Ren, Illinois Institute of Technology  
Jianjun Zhao, Shanghai Jiao Tong University*

### W2: Second International Workshop on Supporting Knowledge Collaboration in Software Development (KCSD2006)

Date: September 19, 9:00 - 17:30

Room: Conference room 2 (2F)

#### Organizers:

*Yunwen Ye, University of Colorado and SRA Key  
Technology Laboratory  
Masao Ohira, Nara Institute of Science and  
Technology*

### W3: Japanese Workshop on Leveraging Web2.0 Technologies in Software Development Environments (WebSDE)

Date: September 19, 9:00 - 17:30

Room: Conference room 3 (2F)

#### Organizers:

*Katsuhisa Maruyama, Ritsumeikan University  
Makoto Matsushita, Osaka University  
Shinichiro Yamamoto, Aichi Prefectural University*

### W4: Japanese Workshop on Requirements Engineering Tools (JWRET)

Date: September 19, 9:00 - 17:30

Room: Conference room 4 (2F)

#### Organizers:

*Takako Nakatani, University of Tsukuba  
Haruhiko Kaiya, Shinshu University  
Yasuyuki Tahara, National Institute of Informatics*

## Doctoral Symposium

Date: September 18, 9:00 - 18:00

Room: Conference Room 103(1F)

#### Students and their Papers:

**Round-Trip Engineering of Framework-Based Software using Framework-Specific Modeling Languages**

*Michał Antkiewicz*

**Integrated Variability Modeling of Features and Architecture in Software Product Line Engineering**

*Deepak Dhungana*

**Software Connectors for Highly Distributed and Voluminous Data Intensive Systems**

*Chris A. Mattmann*

**Coverage Metrics to Measure Adequacy of Black-Box Test Suites**

*Ajitha Rajan*

**Management of Incomplete and Inconsistent Views**

*Mehrdad Sabetzadeh*

**Energy-Awareness in Distributed Java-Based Software Systems**

*Chiyong Seo*

#### Committee Members:

<i>Perry Alexander</i>	<i>Krzysztof Czarnecki</i>
<i>Alexander Egyed</i>	<i>Martin Feather</i>
<i>Bernd Fischer</i>	<i>Michael Goedicke</i>
<i>Paul Grünbacher</i>	<i>John Grundy</i>
<i>Mats Heimdahl</i>	<i>Scott Henninger</i>
<i>Jonathan Maletic</i>	<i>Nenad Medvidovic</i>
<i>Atif Memon</i>	<i>Kurt Stirewalt</i>
<i>Gabriele Taentzer</i>	<i>Willem Visser</i>
<i>David Wile</i>	<i>Tao Xie</i>
<i>Andrea Zisman</i>	

## Corporate Exhibition

Date: September 20, 10:30 - 16:00, September

21, 10:30 - 15:30, September 22, 10:30 - 14:00

Room: Conference Room 102(1F)

NEC Corporation

NTT DATA CORPORATION

Software Engineering Center, Information-  
technology Promotion Agency, Japan

## Tutorials

### T1: Java PathFinder 4 - A Java Analysis Tool

**Date:** September 19, 9:00 - 13:00

**Room:** Conference Room 102(1F)

**Speaker:** Willem Visser, NASA Ames Research Center, USA

#### Abstract

*In recent years there has been an increasing move towards analyzing software programs with the aid of model checking. In this tutorial we will focus on one of the first model checkers developed specifically for analyzing programs - Java PathFinder (JPF). JPF was awarded the 2003 Engineering Innovation award from NASA's Office of Aerospace Technology. JPF is freely available and the development became an open-source project in April 2005. JPF has been used on numerous NASA applications, including, Mars Rover control, Deep-Space 1 fault protection, and Shuttle ground control software as well as on software from companies such as Fujitsu.*

*JPF is an explicit-state model checker that analyzes Java programs on the bytecode level. Since it works on the bytecode level, it can deal with all Java's language features, including, concurrency, dynamic class loading, dynamic creation of threads and objects, garbage collection, exception handling, etc. The tutorial will highlight the main capabilities of the tool and also its current weaknesses. One of the core design decisions was to create a modular tool that could easily be understood and extended by others. A core component of the tutorial will be an introduction to the tool architecture as well as the features making it extensible (Listener interfaces and the Model Java interface). In addition we will discuss the features of the tool that make model checking Java programs tractable, these will include, state compression and storage, dynamic partial-order reduction and using search heuristics.*

*To give an indication of the current research direction of JPF the last part of the tutorial will focus on the tool's new features, such as the symbolic execution and test-case generation facilities. JPF supports symbolic execution of linear integer arithmetic as well dynamically allocated structured data (e.g. linked lists, red-black trees, etc.). We will show how a simple extension of JPF allows the combination of symbolic execution, predicate abstraction and shape analysis for efficient test-input generation.*

*We will conclude the tutorial with a discussion of our experiences of using the tool for the past five years and where we believe the biggest challenges for software model checking is in the future.*

### T2: Visualizing the Structure, Behavior and Evolution of Software

**Date:** September 19, 9:00 - 13:00

**Room:** Conference Room 103(1F)

**Speaker:** Stephan Diehl, University Trier, Germany

#### Abstract

*This half-day tutorial gives an overview of the current state-of-the-art in software visualization. Software visualization encompasses the development and evaluation of methods for graphically representing different aspects of software, including its structure, its execution, and its evolution. In contrast to visual programming and diagramming for software design, software visualization is not so much concerned with the construction, but with the analysis of programs and their development process. Software visualization combines techniques from areas like software engineering, programming languages, data mining, computer graphics, information visualization and human-computer interaction. Topics covered in this tutorial include static program visualization, algorithm animation, visual debugging, as well as the visualization of the evolution of software. In particular we identify common principles illustrated by many examples and give pointers to tools available today.*

**Stephan Diehl** is a full professor for computer science and chair of software engineering at University Trier. He studied computer science and computational linguistics at Saarland University, and as a Fulbright scholar at Worcester Polytechnic Institute, Massachusetts. He received his PhD from Saarland University as a scholar of the German Research Foundation (DFG) working in the group of Prof. Reinhard Wilhelm. Stephan Diehl's research interests include programming languages and compiler design, web technologies, educational software and visualization, in particular software visualization. He teaches courses on software visualization in academia as well as industry (for the Deutsche Informatik Akademie [www.dia-bonn.de](http://www.dia-bonn.de)) and has been heavily involved in various international software visualization related events.

### **T3: Model Checking Networked Programs**

**Date: September 19, 14:00 - 18:00**

**Room: Conference Room 102(1F)**

**Speaker:** *Cyrille Artho, National Institute of Informatics, Japan*

#### **Abstract**

*Model checking tries to explore the entire behavior of a system by investigating each reachable system state. Recently, verification of Java programs has become increasingly important, and several model checkers for Java programs have been created. However, existing software model checkers can only explore a single process and are not applicable to networked applications, where several processes interact. Most non-trivial programs which are in use today use network communication. Recent novel approaches overcome this gap between distributed applications and model checker capabilities.*

*Process centralization is a technique that allows model checking of distributed applications: Processes are converted into threads and merged into a single application. Networked applications can then run as one multi-threaded application. This approach is applicable if all programs to be merged are available in the same format and interprogram communication can be modeled accurately. Previous work by Stoller and Liu inlined parts of one program in another one, modeling certain patterns of interaction using Remote Method Invocation (RMI) under Java. Very recent work extends this to a fully transparent replacement of TCP/IP network communication [1], making this approach suitable for testing, debugging, and software model checking. This tutorial focuses on model checking such applications, including the treatment of all possible interleavings of threads, network messages, and non-determinism regarding possible network failures. Alternatives to centralization will also be presented. The target language is Java, but ideas from this tutorial are also applicable to other programming languages.*

*The tutorial will cover very recent work, but will still be very practically oriented. Theoretical background is given as far as necessary. The focus will be on concrete problems arising from converting multi-process applications to a multi-threaded program, and from modeling network communication.*

**Cyrille Artho** has completed his Ph.D. at ETH Zurich, Switzerland, in May 2005. From June 2006 onwards, he started his post-doctoral research at the National Institute of Informatics in

Tokyo, Japan. He has given several introductory lectures on Model Checking while working together with NII researchers on an advanced course about model checking for distributed Java programs. A first installment of this lecture will have been completed prior to this tutorial, and the survey paper will also be based on material used in the lecture.

### **T4: Automated Software verification and validation: an integrated methodology for the development of complex B2B transactions**

**Date: September 19,14:00 - 18:00**

**Room: Conference Room 103(1F)**

**Speaker:**

*Sophie Ramel, Public Research Center Henri Tudor, Luxembourg*

*Michael Schmitt, Public Research Center Henri Tudor, Luxembourg*

#### **Abstract**

*A measure for the quality of software is the extent to which it corresponds to the business objectives and requirements it was designed for. The earlier those who elicit the requirements and those who will use the software can be involved in the development process, the better the results will be, and the lower the cost and time of development. This applies especially to the development of complex B2B transactions, which may be a long and tedious task, as it requires the collaboration of business and IT experts from all business parties of the value-creation chain.*

*From a business point of view, the following challenges must be addressed to enable electronic business collaboration:*

*\* On a conceptual level, the common planning and coordination of business activities presupposes that all parties involved have the same understanding of the business model. They need to agree on which customers they will address and understand their respective needs. They need to have a common view on the products and services they produce to meet those needs, and they need to clarify who adds what to the value creation and what each party expects in return.*

*\* On an operational level, the business processes of each partner in the supply chain must be aligned with those of its suppliers, intermediaries and customers. This involves a fairly detailed conception of the ideal flow of goods, financial resources and information between the supply chain parties throughout the value creation process. The question that must be answered in*

*this phase is how do we organize ourselves in terms of our value creation activities, the information exchange needed to support them and the rules that help us coordinate and manage our collaboration?*

*While the first level of collaboration focuses on whether what we do is the right thing and that every actor involved understands and buys into the business idea, the second challenge is about doing things right, that is, to structure and organize the business activities of each actor in a way that we achieve our common goals, i.e. to produce a maximum of value for our customers while keeping costs as low as possible.*

*In order for us to deal with both of these levels of collaboration and to keep them in coherence, a necessary prerequisite is to consider the whole value creation process (end-to-end transactions) as opposed to a standard B2B scenario that takes the viewpoint of only two business actors and describes the way that they collaborate with each other.*

*From a SE point of view, the following issues need to be addressed:*

*\* A communication issue between business people and IT developers, especially when the requirements are put down in natural language and may be ambiguous.*

*\* The complexity of the transaction, that spans the whole value-creation process and involves multiple companies.*

*\* The time to market for the development of a new business transaction, from its conception to its deployment.*

*This tutorial presents the audience with an integrated method to design and validate end-to-end B2B transactions. Starting with a description of the business model that gives rise to business collaboration, the audience is presented a systematic approach to develop a sound and integrated business transaction.*

**Sophie Ramel** obtained her engineer diploma in an high school (ENSEEIH) in Toulouse in France, in the computer science and applied mathematics field. She came to the CRP Henri Tudor where she works as a project manager and R&D engineer on different projects, including a project on the automatic animation of B2B transactions modeled in UML; She acquired competencies in the field of software engineering, especially on Java-related technologies, XML and web services, as well as in IT modelling, analysis and IT architectures. Sophie is in charge of an open source integration

project, she is member of the free software innovation platform of the CRP Henri Tudor and works on a methodology for software engineering with open-source/free software components.

**Michael Schmitt** is scientific coordinator and project manager at the CRP Henri Tudor. He has a Master's degree from UMIST/England and an MBA from the University of Saarland. He worked for over 10 years in the field of electronic business both in the private and public sector. Before Michael joined the CITI, he was responsible for the European EDI & B2B clearing center at Avnet Electronics Marketing in Munich, a large distributor of electronic components.

## Social Events and Services

### Internet Access

Wireless LAN is available on the first floor and in conference rooms for technical sessions on the second floor.

### Lunch

#### September 20, 21, 22

Lunch will be served at Gakushi kaikan, which is the other side of the street. A lunch is provided in exchange of a lunch ticket. **Please make sure to bring your lunch ticket with you!**

### Welcome Reception

#### Wednesday September 20 18:00 - 20:00, Josui Kaikan

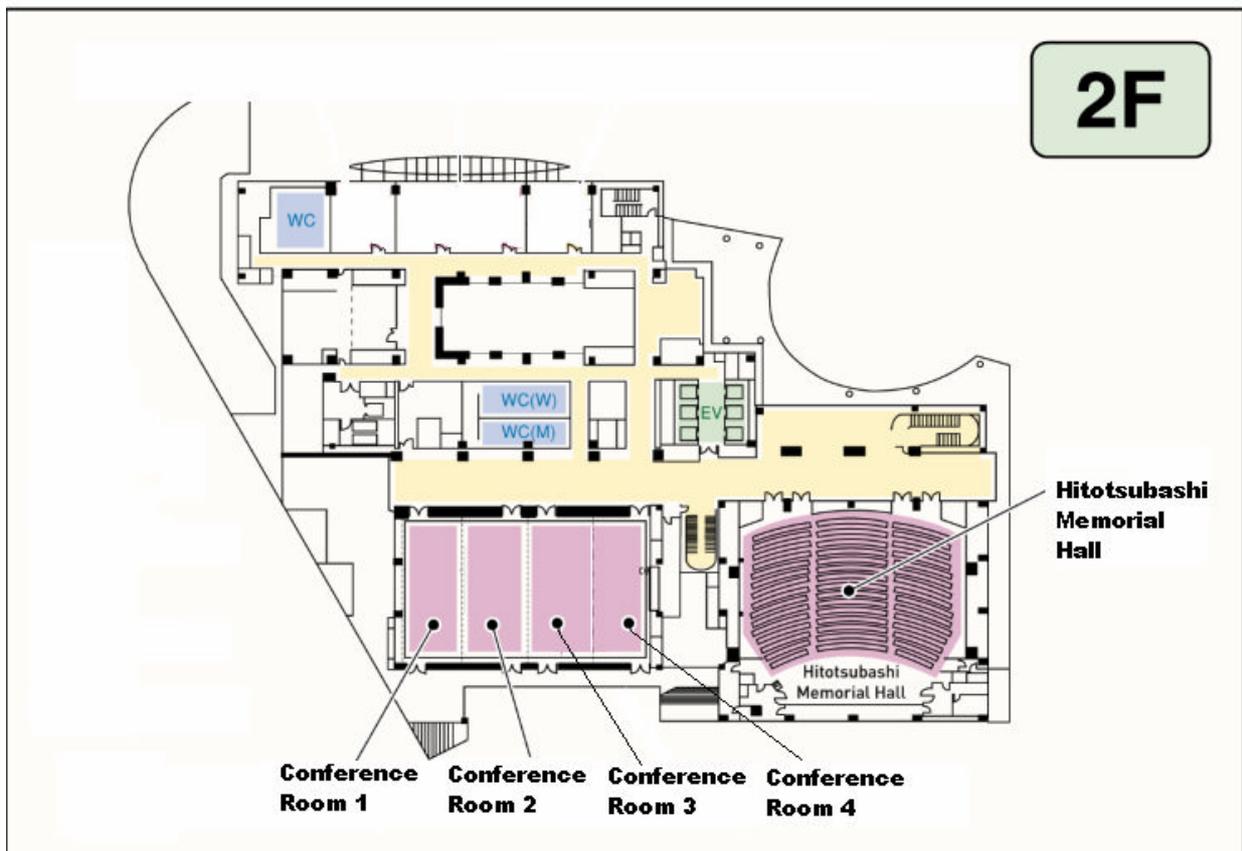
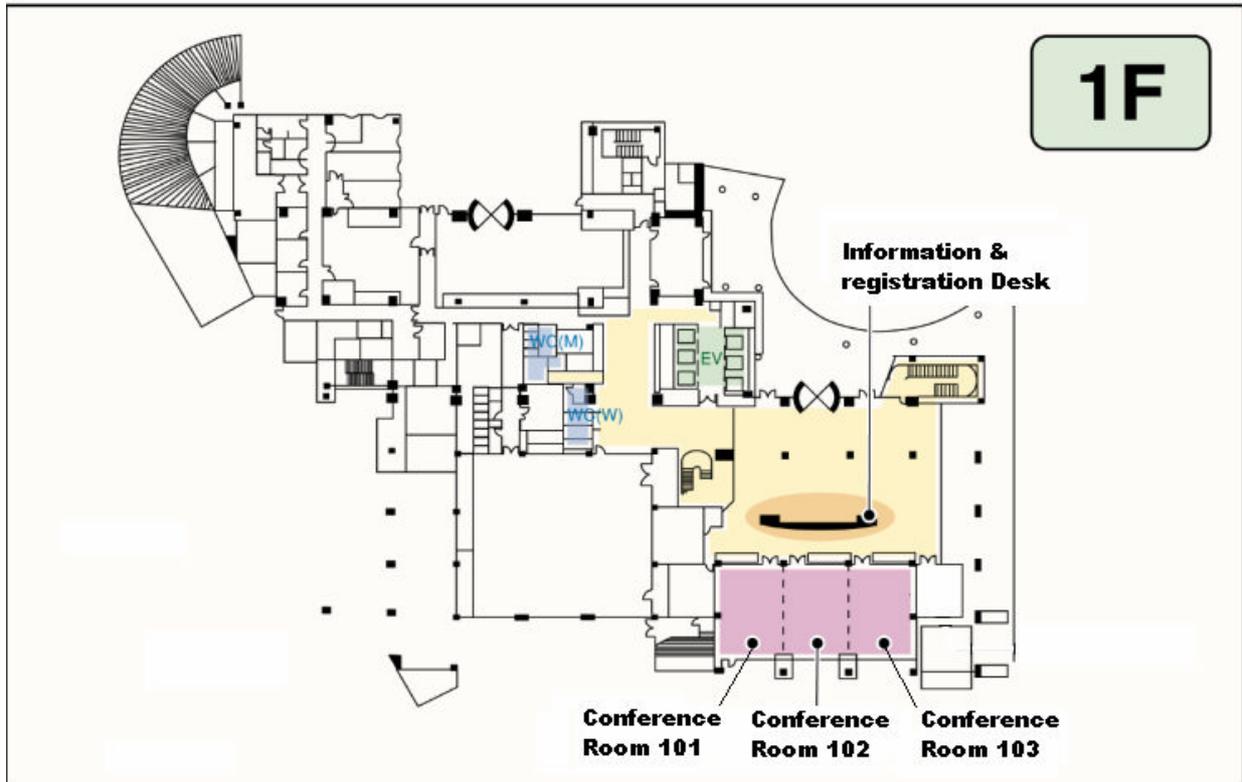
A welcome reception will be held on Wednesday evening, the first day of the main conference at Josui Kaikan, which is next to the conference venue. Drinks and light meal will be served.

### Banquet

#### Thursday September 21 19:00 - 21:00, Happo-en

You can enjoy the beautiful Japanese garden and exquisite Japanese cuisine at the banquet. You will be entertained with samurai sword-fighting and lots more! Perhaps you have a chance to exercise how to posture sword-fighting in Japanese style. ACM SIGSOFT Distinguished Paper award, ASE best paper award will be presented at the Banquet. We will provide a coach bus service, which will take you to the banquet venue from the conference venue. The coach bus service will take you back to major conference hotels. **Please make sure to bring your banquet ticket. You will never enter the banquet venue without it!**

# Floor MAP



## Area MAP

