21st IEEE/ACM
International Conference on Automated Software Engineering
September 18-22, 2006

Tokyo, JAPAN

Final Program

IEEE
Computer Society
SIGART
SIGSOFT
NII
National Institute of Informatics
Japan Chapter
CSK Group
Hitachi
Inspire the Next
NEC
NTT DATA
Toshiba

Toshiba Information Systems (Japan) Corporation

ASE2006 is held in cooperation with Information Processing Society of Japan
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 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 2005, 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

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**Conference Committees**

<table>
<thead>
<tr>
<th>Role</th>
<th>Name and Affiliation</th>
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</thead>
<tbody>
<tr>
<td>General Chair</td>
<td>Shinichi Honiden, National Institute of Informatics, Japan</td>
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</tbody>
</table>
| 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  
Katsuhiko Gondow, Tokyo Institute of Technology, Japan |
| Publication Chair           | Fumihiro Kumeno, Mitsubishi Research Institute, INC., Japan |
| Publicity Chair             | Yoshinao Isobe, National Institute of Advanced Industrial Science and Technology, Japan |
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| Financial Chair             | Nobukazu Yoshioka, National Institute of Informatics, Japan |
| Registration Chair          | Hironobu Kuruma, Hitachi Ltd., Japan                      |
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| Poster Session Chair        | Hiroyuki Nakagawa, Kajima Corporation, Japan              |
| Banquet Chair               | Shunichiro Suenaga, Nihon Unisys Ltd., Japan              |
| Student Volunteer Co-Chairs | Fuyuki Ishikawa, National Institute of Informatics, Japan  
Kazutaka Matsuzaki, National Institute of Informatics, Japan |
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Paul Grünbacher, Johannes Kepler University, Linz, Austria
Mehti Harandi, University of Illinois, Urbana-Champaign, USA
Michael Lowry, NASA Ames Research Center, USA
Bashar Nuseibeh, The Open University, UK
David F. Redmiles, University of California, Irvine, USA
Robert J. Hall, AT&T Labs Research, USA
Perry Alexander, ITTC/ The University of Kansas, USA
Michael Goedicke, University of Duisburg-Essen, Germany
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Julian Richardson, NASA Ames Research Center, USA
David Wile, Teknowledge Corp., USA
Houari Sahraoui, University de Montreal, Canada
John Penix, Google Inc., USA
John Grundy, University of Auckland, New Zealand
Virginie Wiels, ONERA, CERT, France
Kurt Stirewalt, Michigan State University, USA
Andrea Zisman, City University London, UK
Tom Ellman, Vassar College, USA

Program Committee

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Kurt Stirewalt, Michigan State University, USA
Tetsuo Tamai, The University of Tokyo, Japan
Hironori Washizaki, National Institute of Informatics, Japan
Tao Xie, North Carolina State University, USA
Andrea Zisman, City University London, UK

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Nenad Medvidovic, University of Southern California, USA
Wolfgang Emmerich, UCL, UK
# Program at a Glance

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<th>Time</th>
<th>September 18th Monday</th>
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<th>September 19th Tuesday</th>
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<tr>
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<td>CR 2</td>
<td>Tutorial 1</td>
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<td>Willem Visser</td>
<td>Stephan Diehl</td>
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<td>Willem Visser</td>
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<tr>
<th>Time</th>
<th>September 20th Wednesday</th>
<th>September 21th Thursday</th>
<th>September 22nd Friday</th>
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<tbody>
<tr>
<td>9:00</td>
<td>Hitotsubashi Memorial Hall Opening Ceremony</td>
<td>Hitotsubashi Memorial Hall Keynote 1 Kokichi Futatsugi: Verifying Specifications with Proof Source in CafeOBJ</td>
<td>CR 1 &amp; CR 2 Tool Demos</td>
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<tr>
<td>10:30</td>
<td>CR 1 &amp; CR 2 Technical papers Modeling &amp; Synthesis (full: 2, short: 4)</td>
<td>CR 3 &amp; CR 4 Technical papers Analysis I (full: 3)</td>
<td>CR 3 &amp; CR 4 Technical papers Management (full: 3)</td>
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<td>11:00</td>
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<td>12:30</td>
<td>CR 1 &amp; CR 2 Technical papers Architecture (full: 3, short: 3)</td>
<td>CR 3 &amp; CR 4 Technical papers Analysis II (full: 3)</td>
<td>CR 3 &amp; CR 4 Technical papers Mining Software Repositories (full: 3)</td>
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<td>13:00</td>
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<tr>
<td>14:00</td>
<td>CR 1 &amp; CR 2 Technical papers Testing (full: 3, short: 3)</td>
<td>CR 1 &amp; CR 2 Minitutorial Domain-specific Model Checking Using The Bogor Framework</td>
<td>Hitotsubashi Memorial Hall Keynote 3 Sriram Rajamani: Automatic Property Checking for Software</td>
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<tr>
<td>15:30</td>
<td>Refreshment Break</td>
<td>CR 1 &amp; CR 2 Technical papers Impact analysis (full: 3, short: 3)</td>
<td>CR 3 &amp; CR 4 Poster &amp; tool Demos (with Refreshments)</td>
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<tr>
<td>16:00</td>
<td>CR 1 &amp; CR 2 Technical papers Impact analysis (full: 3, short: 3)</td>
<td>CR 3 &amp; CR 4 Technical papers Analysis II (full: 3)</td>
<td>CR 3 &amp; CR 4 Technical papers Mining Software Repositories (full: 3)</td>
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<tr>
<td>17:30</td>
<td>Refreshment Break</td>
<td>CR 1 &amp; CR 2 Technical papers Impact analysis (full: 3, short: 3)</td>
<td>CR 3 &amp; CR 4 Technical papers Mining Software Repositories (full: 3)</td>
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<td>18:00</td>
<td>Josui Kaikan Reception</td>
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<td>21:00</td>
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<td>SOM</td>
<td>Banquet &amp; Awards</td>
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*Acronym*
- CR = Conference Room
- MH = Memorial Hall
- SC = Steering Committee Meeting

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

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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). 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), and the editorial board of Journal of Object Technology (www.jot.fm) and Journal of Applied Logic (www.elsevier.com/locate/jai).

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.
Over the past few years, we have seen several automatic static analysis tools being developed and deployed in industrial-strength software development. I will survey several of these tools ranging from heuristic and scalable analysis tools (such as PReF,i, PReFast and Metal), to sound analysis tools based on counter example driven refinement (such as SLAM). Then, I will present two exciting recent developments in counterexample driven refinement: (1) generalizing counterexample driven refinement to work with any abstract interpretation, and (2) combining directed testing with counterexample driven refinement.

Sriram Rajamani is a Senior Researcher and Research Manager with Microsoft Research India, Bangalore. Prior to moving to the India lab, Sriram was most recently manager of the Software Productivity Tools group in Microsoft Research Redmond, where he led several projects together with is wonderful colleagues — SLAM and Static Driver Verifier, Behave! and Zing. Sriram has a PhD in Computer Science from the University of California at Berkeley. In a previous life Sriram has worked as a programmer for over 5 years writing telecommunication software (for Syntek Inc) and electronic design automation software (for Xilinx Inc). He uses his first hand experience in the realities of commercial software development to guide his choice of problems and approaches to research in software productivity.
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, Sanjeev 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

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 Weiβgerber and Stephan Diehl

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

Sieve: A Tool for Automatically Detecting Variations across Program Versions
Murali Krishna Ramanathan, Ananth Grama, and Suresh Jagannathan
**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

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 Matsushima, 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 Kajya, 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  
Michal 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:  
Perry Alexander  
Alexander Egyed  
Bernd Fischer  
Paul Grünbacher  
Mats Heimdahl  
Jonathan Maletic  
Atil Memon  
Gabriele Taentzer  
David Wile  
Andrea Zisman  
Krzysztof Czarnecki  
Martin Feather  
Michael Goedieke  
John Grundy  
Scott Henninger  
Nenad Medvidovic  
Kurt Stirewalt  
Willem Visser  
Tao Xie

**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
**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) 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.
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 (ENSEEIHT) 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 Masterfs 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!