Proceedings of the

First International Conference on
Software Testing, Verification and Validation

April 9-11, 2008, Lillehammer, Norway

Los Alamitos, California
Washington • Tokyo

IEEE Computer Society
# Table of Contents

First International Conference on Software Testing, Verification and Validation (ICST 2008)

General Chair’s Welcome Message ........................................................................................................ x
Program Chairs’ Introduction ............................................................................................................. xi
Keynote Abstracts ........................................................................................................................................ xii
Committees ..................................................................................................................................................... xv

## Regular Track

### RT1: Test Assessment and Fault Localization-1

Efficient Test Data Generation for Variables with Complex Dependencies ........................................ 3  
*Armin Beer and Stefan Mohacsi*

Relationships between Test Suites, Faults, and Fault Detection in GUI Testing................................. 12  
*Jaymie Strecker and Atif Memon*

Structural Testing of Executables ........................................................................................................ 22  
*Sébastien Bardin and Philippe Herrmann*

### RT2: Test Assessment and Fault Localization-2

Generation of All-Paths Unit Test with Function Calls ........................................................................ 32  
*Patricia Mouy, Bruno Marre, Nicky Williams, and Pascale Le Gall*

A Crosstab-Based Statistical Method for Effective Fault Localization .............................................. 42  
*Eric Wong, Tingting Wei, Lei Zhao, and Yu Qi*

Mutation Testing for Aspect-Oriented Programs .............................................................................. 52  
*Fabiano Cutigi Ferrari, José Carlos Maldonado, and Awais Rashid*

### RT3: Test Assessment and Fault Localization-3

Evaluating Automated Unit Testing in Sulu ..................................................................................... 62  
*Roy Patrick Tan and Stephen Edwards*

On the Predictability of Random Tests for Object-Oriented Software .............................................. 72  
*Ilinca Ciupa, Alexander Pretschner, Andreas Leitner, Manuel Oriol, and Bertrand Meyer*

Less is More: A Minimalistic Approach to UML Model-Based Conformance Test Generation ........ 82  
*Amit Paradkar, Matthew Kaplan, Tim Klinger, Avik Sinha, Clay Williams, and Cemal Yilmaz*

### RT4: Testing Real-time Systems

Traffic-Aware Stress Testing of Distributed Real-Time Systems Based on UML Models in the  
Presence of Time Uncertainty ............................................................................................................. 92  
*Vahid Garousi*
### RT5: Testing Web Applications

- **Scheduling Timed Modules for Correct Resource Sharing**
  Cristina Seceleanu, Paul Pettersson, and Hans Hansson
  
  Birgitta Lindström, Jeff Offutt, and Sten F. Andler

#### State-Based Testing of Ajax Web Applications
- Alessandro Marchetto, Paolo Tonella, and Filippo Ricca

#### A Three-Tiered Testing Strategy for Cookies
- Andrew Tappenden and James Miller

#### Prioritizing User-Session-Based Test Cases for Web Applications Testing
- Sreedevi Sampath, Renée Bryce, Gokulanand Viswanath, Vani Kandimalla, and A. Güneş Koru

### RT6: Regression testing and OO testing-1

- **Trace-based Reflexive Testing of OO Programs with T2**
  Wishnu Prasetya, Tanya Vos, and Arthur Baars

- **Relation between Depth of Inheritance Tree and Number of Methods to Test**
  Muhammad Rabee Shaheen and Lydie du Bousquet

- **Testing Consequences of Grime Buildup in Object Oriented Design Patterns**
  Clemente Izurieta and James Bieman

### RT7: Model Based Testing-1

- **Contract-Based Verification for Aspect-Oriented Refactoring**
  Naoyasu Ubayashi, Jinji Piao, Suguru Shinotsuka, and Tetsuo Tamai

- **Testing Java Components Based on Algebraic Specifications**
  Bo Yu, Liang Kong, Yufeng Zhang, and Hong Zhu

- **UML Activity Diagram Based Testing of Java Concurrent Programs for Data Race and Inconsistency**
  Bin Lei, Linzhang Wang, and Xuanfong Li

### RT8: Test Process and Tools-1

- **Testing Grid Application Workflows Using TTCN-3**
  Jens Grabowski, Helmut Neukirchen, and Thomas Rings

- **Mining Software Repositories to Study Co-Evolution of Production & Test Code**
  Andy Zaidman, Bart Van Rompaey, Serge Demeyer, and Arie van Deursen

- **The Use of Intra-Release Product Measures in Predicting Release Readiness**
  M.P. Ware, F.G. Wilkie, and M. Shapcott
RT9: Test Process and Tools-2

Test-Driven Assessment of Access Control in Legacy Applications ................................................................. 238  
Yves Le Traon, Tejeddine Mouelhi, Alexander Pretschner, and Benoit Baudry

An Evaluation of Two Bug Pattern Tools for Java.................................................................................................. 248  
Stefan Wagner, Florian Deissenboeck,  
Michael Aichner, Johann Wimmer, and Markus Schwalb

Tool Support for Expert-Centred Code Assessments ................................................................................................ 258  
Reinhold Plösch, Harold Gruber,  
Gustav Pomberger, Matthias Saft, and Stefan Schiffer

RT10: Regression Testing and OO Testing-2

Empirical Software Change Impact Analysis using Singular Value Decomposition ............................................... 268  
Mark Sherriff and Laurie Williams

An Empirical Study on Bayesian Network-Based Approach for Test Case Prioritization ........................................ 278  
Siavash Mirarab and Ladan Tahvildari

A Metamodel for the Measurement of Object-Oriented Systems: An Analysis using Alloy ..................................... 288  
Jacqueline McQuillan and James Power

Automated Session Data Repair for Web Application Regression Testing ............................................................. 298  
Nadia Alshahwan and Mark Harman

RT11: Model Based Testing-2

Extended Finite State Machine Based Test Derivation Driven by User Defined Faults .............................................. 308  
Khaled El-Fakih, Anton Kolomeez, Svetlana Prokopenko, and Nina Yevtushenko

Simulation of Multi-Formalism Models with ModHel’X............................................................................................. 318  
Frédéric Boulanger and Cécile Hardebolle

On Combining Multi-Formalism Knowledge to Select Models for Model Transformation Testing ......................... 328  
Sagar Sen, Benoit Baudry, and Jean-Marie Mottu

RT12: Model Based Testing-3

Model-Based Tests for Access Control Policies ....................................................................................................... 338  
Alexander Pretschner, Tejeddine Mouelhi, and Yves Le Traon

Generating Test Requirements for the Service Connections based on the Layers of SOA ........................................ 348  
Hoijin Yoon, Eun Mi Ji, and Byoungju Choi

Detecting and Repairing Inconsistencies across Heterogeneous Models .................................................................... 356  
Dimitrios Kolovos, Richard Paige, and Fiona Polack
Industry Track

IT1: Model Based Testing

Model Based Testing of System Requirements Using UML Use Case Models
Bill Hasling, Helmut Goetz, and Klaus Beetz

Test Instrumentation and Pattern Matching for Automatic Failure Identification
Dan Travison and Geoff Staneff

Comparing Aspects with Conventional Techniques for Increasing Testability
Jani Metsä, Mika Katara, and Tommi Mikkonen

Test Data Provision for ERP Systems
Sebastian Wieczorek, Alin Stefanescu, and Ina Schieferdecker

IT2: Test Process, Organization, and Tools

Selective Homeworkless Review
Eitan Farchi and Shmuel Ur

Designing and Building a Software Test Organization
Bruce Benton

Challenges and Solutions in Test Staff Relocations within a Software Consultancy Company
Daniel Larsson, Robert Feldt, and Håkan Bertilsson

The Role of Stability Testing in Heterogeneous Application Environment
Krzysztof Rogoz and Thomasz Padlo

IT3: Testing Specialized Software

Testing Predictive Software in Mobile Devices
Raghunath Vemuri

A Script-Based Testbed for Mobile Software Frameworks
Walter Hargassner, Thomas Hofer, Claus Klammer, Josef Pichler, and Gernot Reisinger

Debarsi Raha and Mohan Jadhav

An Industrial Case Study of Bypass Testing on Web Applications
Jeff Offutt, Qingxiang Wang, and Joann Ordille

IT4: Test, Validation, and Fault Localization

Pre-Testing Flash Device Driver through Model Checking Techniques
Moonzoo Kim, Yunja Choi, Yunho Kim, and Hotae Kim

Model-Based Testing of Automotive Systems
Eckard Bringmann and Andreas Krämer
IT5: Test and Validation (Short Papers)

How to Test the Intangible Properties of Graphical User Interfaces? ................................................................. 494
Josef Pichler and Rudolf Ramler

Workflow Inspector—A Test Tool for Microsoft Workflow Foundation ................................................................. 498
Alexander Lechner and Ruth Breu

Model-Based Quality Assurance of Windows Protocol Documentation ................................................................. 502
Wolfgang Grieskamp, Dave MacDonald, Nicolas Kicillof, Alok Nandan, Keith Stobie, and Fred Wurden

Student Track

ST1: Test and Validation-1

Distributed In Vivo Testing of Software Applications ........................................................................................... 509
Matt Chu, Christian Murphy, and Gail Kaiser

A Methodology for UML Models V&V ................................................................................................................. 513
Andrea Baruzzo and Marco Comini

Quality of Automatically Generated Test Cases Based on OCL Expressions ........................................................ 517
Stephan Weißleder and Bernd-Holger Schlingloff

Improving Automated Testing of Multi-Threaded Software .................................................................................. 521
Ayla Dantas, Francisco Brasileiro, and Walfredo Cirne

ST2: Test and Validation-2

Functional Search-Based Testing from State Machines ...................................................................................... 525
Raluca Lefticaru and Florentin Ipate

Verifying and Analyzing Adaptive Logic through UML State Models ............................................................... 529
Andres Ramirez and Betty Cheng

Statistical Sampling Based Approach to Alleviate Log Replay Testing .............................................................. 533
Ravidutta Kodre, Hadar Ziv, and Debra Richardson

A Fitness Function to Find Feasible Sequences of Method Calls for Evolutionary Testing of Object-Oriented Programs ........................................................................................................... 537
Myoung Yee Kim and Yoonsik Cheon

A JML Compiler Based on AspectJ ....................................................................................................................... 541
Henrique Rebêlo, Ricardo Lima, Márcio Cornéllo, and Sérgio Soares

Author Index .................................................................................................................................................. 545