TABLE OF CONTENTS

Foreword ........................................................................................................ III
ICSE 2010 Conference Organization ................................................................ V
ICSE 2010 Sponsors and Supporters ................................................................. XIII
ICSE 2010 Contributors .................................................................................. XIII
Authors Index .................................................................................................. 527

Research Papers

QUALITY OF SERVICE:

Performance Modeling in Industry: A Case Study on Storage Virtualization ......................................................... 1
Nikolaus Huber, Steffen Becker, Christoph Rathfelder, Jochen Schweflinghaus, Ralf H. Reussner
Improving Throughput Via Slowdowns .................................................................................................................. 11
Maayan Goldstein, Onn Shehory, Rachel Tzoref-Brill, Shmuel Ur

CERTIFICATION. ASSESSMENT & GOVERNANCE:

A Role-based Qualification and Certification Program for Software Architects: An Experience Report from Siemens .............................................................. 21
Francesca Paulisch, Peter Zimmerer
Assessments in Global Software Development: A Tailorable Framework for Industrial Projects .............................................. 28
Frank Salger, Gregor Engels, Alexander Hofmann
Penalty Policies in Professional Software Development Practice: A Multi-Method Field Study ..................................... 38
Yi Wang, Min Zhang

MODEL-DRIVEN DEVELOPMENT:

A Modeling Language's Evolution Driven by Tight Interaction Between Academia and Industry .................................. 47
Thomas Aschauer, Gerd Dauenhauer, Wolfgang Frech
Andreas Kornstaedt, Eugen Reiswich
Integrating Legacy Systems with MDE .................................................................................................................. 66
Mickael Clavreul, Olivier Barais, Jean-Marc Jezquel

QUALITY ASSURANCE I: STATIC AND DYNAMIC ANALYSIS:

Can Clone Detection Support Quality Assessments of Requirements Specifications? ............................................. 76
Elmar Juergens, Florian Delsenboeck, Martin Feilkau, Benjamin Hummel, Bernhard Schaetz, Stefan Wagner, Christoph Domann, Jonathan Streit
Comprehending Module Dependencies and Sharing ................................................................................................. 86
Yongzheng Wu, Roland H. C. Yap, Rajiv Ramnath
Making Defect-Finding Tools Work for you ......................................................................................................... 96
Mangala Gowri Nanda, Monika Gupta, Saurabh Sinha, Satish Chandra, David Schmidt, Pradeep Balachandran

QUALITY ASSURANCE II: DEFECT MODELING, PREDICTION & TESTING:

Formalization and Validation of a Subset of the European Train Control System ..................................................... 106
A. Chiappini, A. Cimatti, E. Macchi, O. Rebello, M. Roveri, A. Suel, S. Tonetta, B. Vittorini
Reverse Engineering with the Eclipse Tool Suite ......................................................... 295
Markus Von Detten, Matthias Meyer, Dietrich Travkin

SOABench: Performance Evaluation of Service-Oriented Middleware Made Easy .................. 297
Domenico Bianciulli, Walter Binder, Mauro Luigi Drago

SM@RT: Representing Run-time System Data as MOF-compliant Models .......................... 299
Hui Song, Gang Huang, Franck Chauvel, Yanchun Sun, Hong Mei

Eliminating Dead-code from XQuery Programs ......................................................... 301
Pierre Geneves, Nabil Layaied

EMFStore: A Model Repository for EMF Models ....................................................... 303
Maximilian Koegel, Jonas Helming

CUTS: A System Execution Modeling Tool for Realizing Continuous System Integration Testing ........................................... 305
James H. Hill

SSG: A Model-Based Development Environment for Smart, Security-Aware GUIs ................ 307
Miguel A. Garcia de Dios, Carolina Dania, Michael Schlapfer, David Basin, Manuel Clavel, Marina Egea

Managing Iterations with UNICASE ........................................................................... 309
Jonas Helming, Maximilian Koegel

JDF: Detecting Duplicate Bug Reports In Jazz ........................................................... 311
Yoonsik Song, Xiaoyin Wang, Tao Xie, Lu Zhang, Hong Mei

Using Invariant Functions and Invariant Relations to Compute Loop Functions ................. 313
Lamia Labed Jilani, Olfa Mraihi, Asma Louhichi, Wided Ghardallou, Ali Mili

LM: A Miner for Scenario-Based Specifications ......................................................... 315
Tuan-Anh Doan, David Lo, Shaaher Muna, Siao-Cheng Khoo

RAW: Runtime Automatic Workarounds ..................................................................... 317
Antonio Carzaniga, Alessandra Gorla, Nicolo Pertino, Mauro Pezze

SOFTWARE ENGINEERING IN SOUTH AFRICA:

Software Engineering in South Africa ........................................................................... 319
Derrick G. Kourie, Bruce W. Watson

EARLY PHASE:

Portable Secure Identity Management for Software Engineering .................................. 321
Christopher Stait

Dynamic Service Quality And Resource Negotiation for High-Availability Service-Oriented Systems .................................................. 323
Nicholas May

Zenet: Generating and Enforcing Real-Time Temporal Invariants .................................. 325
Chris Lewis

Balancing Collaboration and Discipline in Software Development Processes .................. 327
Andrea Magalhaes Magalhaes

A Proposal for Consistency Checking in Dynamic Software Product Line Models Using OCL .................................................. 329
Fabiana G. Marinho

Behavioural Validation of Software Engineering Artefacts ........................................... 331
Guido De Caso

Umple: A Model-Oriented Programming Language .................................................... 333
Omar Badreddin

An Incremental Methodology for Quantitative Software Architecture Evaluation with Probabilistic Models .................................................. 335
Indika Moseniya

Synthesize Software Product Line ................................................................................. 337
Xiaoru Zhang

Choreography of Intelligent E-Services ........................................................................ 339
W. L. Ntshinga

A Framework for Handling Variants of Software Models ............................................ 341
Christian Pichler

Improving Wide-Area Distributed System Availability ................................................ 343
Bruno Wastemann

Risk Assessment on Distributed Software Projects ...................................................... 345
Adailton Magalhaes Magalhaes
VisAr3d: An Approach to Software Architecture Teaching Based on Virtual and Augmented Reality .......................................................... 347
Claudia Susie C. Rodrigues

Change Impact Analysis from Business Rules .................................................................................. 349
Antonio Oliveira Filho

Software Architecture for Systems of Software Intensive Systems (S3): The Concepts and Detection of Inter-System Relationships .................................................................................... 351
John Brondum

MATURE PHASE:

Formal Methods for Web Services: A Taxonomic Approach .......................................................... 353
K. S. May Chan

Exploratory Study of a UML Metric for Fault Prediction ................................................................. 357
Ana Erika Camargo Cruz

Feature-Oriented Requirements Modelling .................................................................................... 361
Pourya Shaker

Automatic Enforcement of Architectural Design Rules ................................................................. 365
Anders Mattsson

SMT-Based Bounded Model Checking for Multi-Threaded Software in Embedded Systems .......... 369
Lucas Cordeiro

Enhancing Collaboration of Multi-Developer Projects with Synchronous Changes ..................... 373
Lile Hattori

SOFAS: Software Analysis Services .................................................................................................. 377
Giacomo Ghezzi

Informal Software Design Knowledge Reuse ................................................................................. 381
Gerald Bortis

The Role of Emergent Knowledge Structures in Collaborative Software Development .................. 385
Christoph Treude

Capturing the Long-Term Impact of Changes ................................................................................. 389
Kim Sebastian Herzog

Failure Preventing Recommendations ............................................................................................ 393
Adrian Schroter

Impact Analysis for Event-Based Components and Systems .......................................................... 397
Daniel Popescu

Empirical Evaluation of Effort on Composing Design Models ...................................................... 401
Kleinner Farias

Analysis of Execution Log Files ........................................................................................................ 405
Meiyappan Nagappan

Towards End-User Enabled Web Service Consumption for Mashups ........................................... 409
Marcus Roy

Constraint Solving Techniques for Software Testing and Analysis ............................................... 413
Feifei Ma

A Methodology to Support Load Test Analysis ............................................................................... 417
Haroon Malik

EMERGING FACULTY SYMPOSIUM:

Emerging Faculty Symposium 2010 ............................................................................................... 421
Hausi Muller, Andreas Zeller

WORKSHOP INTRODUCTIONS:

SUITE 2010: 2nd International Workshop on Search-Driven Development - Users, Infrastructure, Tools & Evaluation ................................................................. 422
Sushil Bajracharya, Adrian Kuhn, Yunwen Ye

Grace A. Lewis, Andreas Metzger, Marco Pistore, Dennis Smith, Andrea Zisman
<table>
<thead>
<tr>
<th>Conference Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Horizons in Multicore Software Engineering</td>
<td>426</td>
</tr>
<tr>
<td>The 6th International Workshop on Software Engineering for Secure Systems (SESS'10)</td>
<td>428</td>
</tr>
<tr>
<td>The 6th International Workshop on Software Engineering for Secure Systems (SESS'10)</td>
<td>428</td>
</tr>
<tr>
<td>Cooperative and Human Aspects of Software Engineering (CHASE 2010)</td>
<td>430</td>
</tr>
<tr>
<td>Fifth International Workshop on Sharing and Reusing Architectural Knowledge (SHARK 2010)</td>
<td>432</td>
</tr>
<tr>
<td>Flexible Modeling Tools (FlexiTools2010)</td>
<td>434</td>
</tr>
<tr>
<td>SESIA 2010: Workshop on Software Engineering for Sensor Network Applications</td>
<td>436</td>
</tr>
<tr>
<td>Bridging the Gap Between the Theory and Practice of Software Test Automation</td>
<td>438</td>
</tr>
<tr>
<td>Second International Workshop on Software Research and Climate Change</td>
<td>442</td>
</tr>
<tr>
<td>First International Workshop on Quantitative Stochastic Models in the Verification and Design of Software Systems (QUOVADIS 2010)</td>
<td>444</td>
</tr>
<tr>
<td>Second International Workshop on Software Research and Climate Change</td>
<td>446</td>
</tr>
<tr>
<td>First International Workshop on Software Engineering for Sensor Network Applications</td>
<td>448</td>
</tr>
<tr>
<td>2nd International Workshop on Software Engineering in Health Care (SEHC 2010)</td>
<td>450</td>
</tr>
<tr>
<td>RSSE 2010: Second International Workshop on Recommendation Systems for Software Engineering</td>
<td>452</td>
</tr>
<tr>
<td>Workshop on Emerging Trends in Software Metrics (WETSoM 2010)</td>
<td>454</td>
</tr>
<tr>
<td>1st International Workshop on Replication in Empirical Software Engineering Research (RESER)</td>
<td>456</td>
</tr>
<tr>
<td>Software Development Governance (SDG) Workshop</td>
<td>458</td>
</tr>
<tr>
<td>Fourth International Workshop on Software Clones (IWSC)</td>
<td>460</td>
</tr>
<tr>
<td>2010 ICSE International Workshop on Advances and Applications of Problem Orientation (WAAPO-2010)</td>
<td>462</td>
</tr>
</tbody>
</table>

**TUTORIALS:**

<table>
<thead>
<tr>
<th>Tutorials</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysing &quot;People&quot; Problems in Requirements Engineering</td>
<td>464</td>
</tr>
<tr>
<td>Software Architecture: Foundations, Theory, and Practice</td>
<td>466</td>
</tr>
<tr>
<td>Generative Software Development</td>
<td>468</td>
</tr>
<tr>
<td>Cloud Service Engineering</td>
<td>470</td>
</tr>
<tr>
<td>Bayesian Methods For Data Analysis in Software Engineering</td>
<td>472</td>
</tr>
<tr>
<td>Cost Effectiveness Analysis in Software Engineering</td>
<td>474</td>
</tr>
<tr>
<td>Coaching Agile Software Projects: Tutorial Proposal - ICSE 2010</td>
<td>476</td>
</tr>
<tr>
<td>Parameterized Unit Testing: Theory and Practice</td>
<td>478</td>
</tr>
</tbody>
</table>
The "Physics" Of Notations: A Scientific Approach to Designing Visual Notations in Software Engineering
Daniel L. Moody .......................................................... 480

Multicore Software Engineering: The Next Challenge in Software Engineering
Victor Pankratius, Walter F. Tichy, Peter Hinsbeek ......................................................... 482

Engineering Safety- And Security-Related Requirements for Software-Intensive Systems:
Tutorial Summary .......................................................... 483
Donald G. Firesmith

Using Ethnographic Methods in Software Engineering Research
Helen Sharp, Cleidson Desouza, Yvonne Dittrich ............................................................ 485

Design Science Methodology: Principles and Practice ....................................................... 487
Roel Wieringa

Combinatorial Test Design in Practice .............................................................. 489
Myra B. Cohen, Shmuel Ur

Software Architecture and Agile Software Development: A Clash of Two Cultures?
Philippe Kruchten ................................................................. 491

Code Clone Detection in Practice .......................................................... 493
Florian Deissenboeck, Benjamin Hummel, Elmar Juergens

New Processes for New Horizons: The Incremental Commitment Model
Barry Boehm, Jo Ann Lane .......................................................... 495

Mining Software Engineering Data ......................................................................... 497
Ahmed E. Hassan, Tao Xie

STUDENT RESEARCH COMPETITION:

Behavioural Validation of Software Engineering Artefacts ............................................. 499
Guido De Cans

QED: A Proof System Based on Reduction and Abstraction for the Static
Verification of Concurrent Software ............................................................................. 501
Tayfun Elmas

Software Engineering Abstractions for the Multi-Touch Revolution
Lode Hoste ........................................................................................................ 503

Predicting Build Outcome with Developer Interaction in Jazz ........................................ 505
Adrian Schroter

Improved Social Trustability of Code Search Results ..................................................... 507
Florian S. Gysin

Test-Driven Roles for Pair Programming ..................................................................... 509
Max Goldman

Providing Support for Creating Next Generation Software Architecture Languages
Ivano Malavolta ........................................................................................................ 511

STORM: Static Unit Checking of Concurrent Programs .................................................. 513
Zvonimir Rakamaric

Making Program Refactoring Safer ............................................................................ 515
Gustavo Soares

Staying Aware of Relevant Feeds In Context ................................................................. 517
Thomas Fritz

Developing And Evaluating the Code Bubbles Metaphor ............................................... 519
Andrew Bragdon

Summarizing Software Concerns ................................................................................. 521
Sarah Rashbar

Commit 2.0: Enriching Commit Comments with Visualization ....................................... 523
Marco D'Ambros

Helios: Impact Analysis for Event-Based Components and Systems ................................ 525
Daniel Popescu