2010 IEEE 21st International Symposium on Software Reliability Engineering

(ISSRE 2010)

San Jose, California, USA
1 – 4 November 2010
2010 IEEE 21st International Symposium on Software Reliability Engineering

ISSRE 2010

Table of Contents

Message from General Chair and Program Committee Chair..............................................x
Organizing Committee...........................................................................................................xii
Program Committee............................................................................................................xiii
Steering Committee...............................................................................................................xv
Industry Committee...........................................................................................................xvi
Reviewers..............................................................................................................................xvii

Predicting Defects

Improving the Precision of Dependence-Based Defect Mining by Supervised Learning of Rule and Violation Graphs ..........................................................1
  Boya Sun, Andy Podgurski, and Soumya Ray

Computing the Number of Calls Dropped Due to Failures ..............................................11
  Kishor S. Trivedi, Dazhi Wang, and Jason Hunt

Propagating Bug Fixes with Fast Subgraph Matching ......................................................21
  Boya Sun, Gang Shu, Andy Podgurski, Shirong Li, Shijie Zhang, and Jiong Yang

Reliability Modeling 1

A Multi-factor Software Reliability Model Based on Logistic Regression .........................31
  Hiroyuki Okamura, Yusuke Etani, and Tadashi Dohi

Assessing Asymmetric Fault-Tolerant Software ..............................................................41
  Peter Popov and Lorenzo Strigini

Flexible, Any-Time Fault Tree Analysis with Component Logic Models .......................51
  Marc Förster and Daniel Schneider
Empirical Studies 1

Errors on Space Software Requirements: A Field Study and Application
Scenarios .................................................................61

Paulo C. Véras, Emilia Villani, Ana Maria Ambrosio, Nuno Silva, Marco Vieira,
and Henrique Madeira

Software Aging Analysis of the Linux Operating System ........................................71

Domenico Cotroneo, Roberto Natella, Roberto Pietrantuono, and Stefano Russo

Evaluating the Use of Requirement Error Abstraction and Classification
Method for Preventing Errors during Artifact Creation: A Feasibility Study ................81

Gursimran S. Walia and Jeffrey C. Carver

Security 1

As-If Infinitely Ranged Integer Model .................................................................91

Roger B. Dannenberg, Will Dormann, David Keaton, Robert C. Seacord,
David Svoboda, Alex Volkovitsky, Timothy Wilson, and Thomas Plum

Towards a Bayesian Approach in Modeling the Disclosure of Unique Security
Faults in Open Source Projects ..........................................................................101

Prasanth Anbalagan and Mladen Vouk

Security Trend Analysis with CVE Topic Models ...................................................111

Stephan Neuhaus and Thomas Zimmermann

Testing 1

Automatic Mutation Test Case Generation via Dynamic Symbolic Execution ....121

Mike Papadakis and Nicos Malevris

Constraint-Based Test Input Generation for Java Bytecode .................................131

Florence Charreteur and Arnaud Gotlieb

An Industrial Investigation of Similarity Measures for Model-Based Test Case
Selection ..............................................................................141

Hadi Hemmati and Lionel Briand

Validation 1

A 2-Phase Method for Validation of Matching Pair Property with Case Studies
of Operating Systems ....................................................................................151

Kang Gui and Suraj Kothari

Detecting Dependences and Interactions in Feature-Oriented Design ....................161

Sven Apel, Wolfgang Scholz, Christian Lengauer, and Christian Kästner
A Consistency Check Algorithm for Component-Based Refinements of Fault Trees .................................................. 171
Dominik Domis, Kai Höfig, and Mario Trapp

Testing 2
Automating System Tests Using Declarative Virtual Machines ................................................................. 181
Sander van der Burg and Eelco Dolstra
DoDOM: Leveraging DOM Invariants for Web 2.0 Application Robustness Testing ........................................ 191
Karthik Pattabiraman and Benjamin Zorn
Pinpointing the Subsystems Responsible for the Performance Deviations in a Load Test .............................. 201
Haroon Malik, Bram Adams, and Ahmed E. Hassan

Reliability Modeling 2
Using Accelerated Life Tests to Estimate Time to Software Aging Failure .............................................. 211
Rivalino Matias Jr., Kishor S. Trivedi, and Paulo R.M. Maciel
The Importance of Data Quality in Software Reliability Modeling ............................................................ 220
Elisabeth A. Nguyen, Carlos F. Rexach, David P. Thorpe, and Andrew E. Walther
An Efficient Method for Architecture-Based Reliability Evaluation for Evolving Systems with Changing Parameters ................................................................. 229
Indika Meedeniya and Lars Grunske

Empirical Studies 2
Log-Based Reliability Analysis of Software as a Service (SaaS) ............................................................... 239
Sean Banerjee, Hema Srikanth, and Bojan Cukic
Characterizing Failures in Mobile OSes: A Case Study with Android and Symbian ........................................ 249
Amiya Kumar Maji, Kangli Hao, Salmin Sultana, and Saurabh Bagchi
Empirical Evaluation of Factors Affecting Distinction between Failing and Passing Executions .................. 259
Arin Zahalka, Katerina Goseva-Popstojanova, and Jeffrey Zemerick

Practical Experience Reports
A Case Study on Safety Cases in the Automotive Domain: Modules, Patterns, and Models .............................. 269
Stefan Wagner, Bernhard Schätz, Stefan Puchner, and Peter Kock
A Large-Scale Industrial Case Study on Architecture-Based Software
Reliability Analysis ......................................................................................................................... 279
  Heiko Koziolek, Bastian Schlich, and Carlos Bilich
Comparing SQL Injection Detection Tools Using Attack Injection: An
Experimental Study ........................................................................................................................... 289
  Ivano Alessandro Elia, José Fonseca, and Marco Vieira
The Web Attacker Perspective - A Field Study ................................................................................... 299
  José Fonseca, Marco Vieira, and Henrique Madeira

Empirical Studies 3
Change Bursts as Defect Predictors ................................................................................................... 309
  Nachiappan Nagappan, Andreas Zeller, Thomas Zimmermann, Kim Herzig,
  and Brendan Murphy
Calibrating Probabilistic GUI Testing Models Based on Experiments
and Survival Analysis ....................................................................................................................... 319
  Cristiano Bertolini, Alexandre Mota, and Eduardo Aranha
The Impact of Coupling on the Fault-Proneness of Aspect-Oriented Programs:
An Empirical Study .......................................................................................................................... 329
  Rachel Burrows, Fabiano C. Ferrari, Otávio A.L. Lemos, Alessandro Garcia,
  and François Taiani

Security 2
Preventing Overflow Attacks by Memory Randomization ................................................................... 339
  Vivek Iyer, Amit Kanitkar, Partha Dasgupta, and Raghunathan Srinivasan
Automata-Based Verification of Security Requirements of Composite Web
Services ................................................................................................................................................... 348
  Hongyu Sun, Samik Basu, Vasant Honavar, and Robyn Lutz
Client-Side Detection of Cross-Site Request Forgery Attacks .............................................................. 358
  Hossain Shahriar and Mohammad Zulkernine

Testing 3
Is Data Privacy Always Good for Software Testing? ............................................................................. 368
  Mark Grechanik, Christoph Csallner, Chen Fu, and Qing Xie
Prioritizing Mutation Operators Based on Importance Sampling .................................................... 378
  Mohan Sridharan and Akbar Siami Namin
On the Round Trip Path Testing Strategy .......................................................................................... 388
  May Khalil and Yvan Labiche
Validation 2

FTCloud: A Component Ranking Framework for Fault-Tolerant Cloud Applications

Zibin Zheng, Tom Chao Zhou, Michael R. Lyu, and Irwin King

Optimizing Incremental Scope-Bounded Checking with Data-Flow Analysis

Danhua Shao, Divya Gopinath, Sarfraz Khurshid, and Dewayne E. Perry

Author Index