

2011 IEEE 17th Pacific Rim International Symposium on Dependable Computing

(PRDC 2011)

**Pasadena, California, USA
12-14 December 2011**



**IEEE Catalog Number: CFP11245-PRT
ISBN: 978-1-4577-2005-5**

2011 17th IEEE Pacific Rim International Symposium on Dependable Computing

PRDC 2011

Table of Contents

Message from the General Chair.....	x
Message from the Program Co-chairs.....	xi
Organizing Committee.....	xii
Program Committee.....	xiii
Steering Committee.....	xv
Reviewers.....	xvi

Software Reliability and Evaluation

Parametric Bootstrapping for Assessing Software Reliability Measures	1
<i>Toshio Kaneishi and Tadashi Dohi</i>	
Estimating Software Intensity Function via Multiscale Analysis and Its Application to Reliability Assessment	10
<i>Xiao Xiao and Tadashi Dohi</i>	
Unification of Software Reliability Models Using Markovian Arrival Processes	20
<i>Hiroyuki Okamura and Tadashi Dohi</i>	
Using Dependability Benchmarks to Support ISO/IEC SQuaRE	28
<i>Jesús Frigonal, David de Andrés, Juan-Carlos Ruiz, and Regina Moraes</i>	

Testing

Augmenting Functional Broadside Tests for Transition Fault Coverage with Bounded Switching Activity	38
<i>Irith Pomeranz</i>	
Generation of Mixed Broadside and Skewed-Load Diagnostic Test Sets for Transition Faults	45
<i>Irith Pomeranz</i>	
A Dependability Solution for Homogeneous MPSoCs	53
<i>Xiao Zhang and Hans G. Kerkhoff</i>	

Communications and Networks

Gossiping with Network Coding	63
<i>Shun Tokuyama, Tatsuhiro Tsuchiya, and Tohru Kikuno</i>	
On Detecting Termination in Cognitive Radio Networks	71
<i>Shantanu Sharma and Awadhesh Kumar Singh</i>	
Utilizing Hidden Markov Models for Formal Reliability Analysis of Real-Time Communication Systems with Errors	79
<i>Maurice Sebastian, Philip Axer, and Rolf Ernst</i>	

Memories

RAMpage: Graceful Degradation Management for Memory Errors in Commodity Linux Servers	89
<i>Horst Schirmeier, Jens Neuhalfen, Ingo Korb, Olaf Spinczyk, and Michael Engel</i>	
Exploiting Total Order Multicast in Weakly Consistent Transactional Caches	99
<i>Pedro Ruivo, Maria Couceiro, Paolo Romano, and Luís Rodrigues</i>	
COMeT: Continuous Online Memory Test	109
<i>Musfiq Rahman, Bruce R. Childers, and Sangyeun Cho</i>	

Safety

Efficient Task Allocation to FPGAs in the Safety Critical Domain	119
<i>Philippa Conmy and Iain Bate</i>	
Dependability Enhancement of Reactor Containment in Safety Critical Nuclear Power Plants	129
<i>Chi-Shiang Cho, Wei-Ho Chung, Deyun Gao, Hongke Zhang, and Sy-Yen Kuo</i>	
Dependability Improvement for Critical Systems	135
<i>Herbert Hecht</i>	

Detection and Recovery

Numerical Defect Correction as an Algorithm-Based Fault Tolerance Technique for Iterative Solvers	144
<i>Fabian Oboril, Mehdi B. Tahoori, Vincent Heuveline, Dimitar Lukarski, and Jan-Philipp Weiss</i>	
Bio-inspired Error Detection for Complex Systems	154
<i>Martin Drozda, Iain Bate, and Jon Timmis</i>	
Self-Checking Components for Dependable Interactive Cockpits Using Formal Description Techniques	164
<i>A. Tankeu-Choitât, D. Navarre, P. Palanque, Y. Deleris, J-C Fabre, and C. Fayollas</i>	

Security

Characterizing Attackers and Attacks: An Empirical Study	174
<i>Gabriel Salles-Loustau, Robin Berthier, Etienne Collange, Bertrand Sobesto, and Michel Cukier</i>	
Specification-Based Intrusion Detection for Advanced Metering Infrastructures	184
<i>Robin Berthier and William H. Sanders</i>	
A Clustering Approach for Web Vulnerabilities Detection	194
<i>A. Dessiatnikoff, R. Akrouf, E. Alata, M. Kaâniche, and V. Nicomette</i>	

Virtualization and Analysis of Systems

Workload Adaptive Checkpoint Scheduling of Virtual Machine Replication	204
<i>Balazs Gerofi and Yutaka Ishikawa</i>	
Resilient Virtual Clusters	214
<i>Michael Le, Israel Hsu, and Yuval Tamir</i>	
Recovery from Failures Due to Mandelbugs in IT Systems	224
<i>Kishor S. Trivedi, Rajesh Mansharamani, Dong Seong Kim, Michael Grottke, and Manoj Nambiar</i>	
Trend Analyses of Accidents and Dependability Improvement in Financial Information Systems	234
<i>Koichi Bando and Kenji Tanaka</i>	

Processors and Hardware

Layered Diagnosis and Clock-Rate Correction for the TTEthernet Clock Synchronization Protocol	244
<i>Wilfried Steiner and Bruno Dutertre</i>	
A Self-Stabilizing Synchronization Protocol for Arbitrary Digraphs: A Self-Stabilizing Distributed Clock Synchronization Protocol For Arbitrary Digraphs	254
<i>Mahyar R. Malekpour</i>	
Area-Per-Yield and Defect Level of Cascaded TMR for Pipelined Processors	264
<i>Masayuki Arai and Kazuhiko Iwasaki</i>	

Fast Abstracts

Correcting DFT Codes with Modified Berlekamp-Massey Algorithm and Syndrome Extension	272
<i>Robert Redinbo</i>	

Towards Making Dependability Visual – Combining Model-Based Design and Virtual Realities	274
<i>Matthias Gdemann, Michael Lipaczewski, Frank Ortmeier, Marco Schumann, and Robert Eschbach</i>	
A Method of Gate-Level Circuit Reliability Estimation Based on Iterative PTM Model	276
<i>Jie Xiao, Jianhui Jiang, Xuguang Zhu, and Chengtian Ouyang</i>	
A Framework for Systematic Testing of Multi-threaded Applications	278
<i>Mihai Florian</i>	
Model Checking Multitask Applications for OSEK Compliant Real-Time Operating Systems	280
<i>Mark L. McKelvin Jr., Edward B. Gamble Jr., and Gerard J. Holzmann</i>	
Task Mapping and Partition Allocation for Mixed-Criticality Real-Time Systems	282
<i>Domitian Tmaş-Selicean and Paul Pop</i>	
Revisiting Fault-Injection Experiment-Platform Architectures	284
<i>Horst Schirmeier, Martin Hoffmann, Rdiger Kapitza, Daniel Lohmann, and Olaf Spinczyk</i>	
Test Generation and Computational Complexity	286
<i>Jzsef Sziray</i>	
One Optimization Method on the Navigation Performance Reliability of Planing Craft	288
<i>Songlin Yang, Ning Yu, Feng Zhu, and Huilei Li</i>	
Native Binary Mutation Analysis for Embedded Software and Virtual Prototypes in SystemC	290
<i>Christoph Kuznik and Wolfgang Mller</i>	
A Test Model for Hardware and Software	292
<i>Jzsef Sziray</i>	
Tool Supported Model-Based Safety Analysis and Optimization	294
<i>Matthias Gdemann, Michael Lipaczewski, and Frank Ortmeier</i>	

Industry Track

A Method of Calculating Safety Integrity Level for IEC 61508 Conformity Software	296
<i>Takaji Fujiwara, Mitsuhiro Kimura, Yoshinobu Satoh, and Shigeru Yamada</i>	
Automatic Robustness Assessment of DDS-Compliant Middleware	302
<i>A. Napolitano, G. Carrozza, A. Bovenzi, and C. Esposito</i>	
Failure Analysis of a Complex Learning Framework Incorporating Multi-modal and Semi-supervised Learning	308
<i>Laura L. Pullum and Christopher T. Symons</i>	

Malware Profiler Based on Innovative Behavior-Awareness Technique	314
<i>Shih-Yao Dai, Yarochkin Fyodor, Sy-Yen Kuo, Ming-Wei Wu, and Yennun Huang</i>	
Access Control of Web and Java Based Applications	320
<i>Kam S. Tso, Michael J. Pajevski, and Bryan Johnson</i>	
Author Index	326