



# Proceedings



## 13th Pacific Rim International Symposium on Dependable Computing



17-19 December 2007 • Melbourne, Victoria, Australia



Los Alamitos, California  
Washington • Tokyo





# Proceedings



## 13th Pacific Rim International Symposium on Dependable Computing



# Table of Contents

<b>Message from the General and Program Committee Chairs</b> .....	x
<b>Conference Organizers</b> .....	xi

---

### **Algorithms, Analysis, and Theory**

Generic Fault-Tolerance Mechanisms Using the Concept of Logical Execution Time .....	3
<i>Christian Buckl, Matthias Regensburger, Alois Knoll, and Gerhard Schrott</i>	
Error Recovery Method for Multiple-Dictionary Compression Method .....	11
<i>Masato Kitakami and Yuta Noguchi</i>	
Fault Detection System Activated by Failure Information .....	19
<i>Masato Sakai, Hiroya Matsuba, and Yutaka Ishikawa</i>	
Comparative Analysis of QoS and Memory Usage of Adaptive Failure Detectors.....	27
<i>Naixue Xiong, Y. Yang, and Xavier Défago</i>	

Quantifying Software Maintainability Based on a Fault-Detection/Correction Model.....	35
<i>Kazuya Shibata, Koichiro Rinsaka, Tadashi Dohi, and Hiroyuki Okamura</i>	
PISRAT: Proportional Intensity-Based Software Reliability Assessment Tool .....	43
<i>Kazuya Shibata, Koichiro Rinsaka, and Tadashi Dohi</i>	
An Automatic Real-Time Analysis of the Time to Reach Consensus .....	53
<i>Tatsuhiko Tsuchiya and André Schiper</i>	
Combinatorial Constructions of Multi-erasure-Correcting Codes with Independent Parity Symbols for Storage Systems.....	61
<i>Gang Wang, Sheng Lin, Xiaoguang Liu, Guangjun Xie, and Jing Liu</i>	
Failure Detectors and Extended Paxos for $k$ -Set Agreement.....	69
<i>Wei Chen, Jialin Zhang, Yu Chen, and Xuezheng Liu</i>	
An Accurate Model of Software Reliability .....	77
<i>Shiyi Xu</i>	
Regression Testing Based on UML Design Models.....	85
<i>Atifah Ali, Aamer Nadeem, Muhammad Zohaib Z. Iqbal, and Mohammad Usman</i>	
Model Based Development of Safety-Critical Systems Using Template Based Code Generation .....	89
<i>Matthias Regensburger, Christian Buckl, Alois Knoll, and Gerhard Schrott</i>	
Predicting Defective Software Components from Code Complexity Measures.....	93
<i>Hongyu Zhang, Xiuzhen Zhang, and Ming Gu</i>	
Neural-Network Based Test Cases Generation Using Genetic Algorithm .....	97
<i>Ruilian Zhao and Shanshan Lv</i>	
A Measurement Tool of End-User Computing Capability in Competency Perspective.....	101
<i>Chui Young Yoon and Keon Myung Lee</i>	

## **Dependable Networks**

Fault Tolerance for Super-Peers of P2P Systems .....	107
<i>Jenn-Wei Lin, Ming-Feng Yang, and Jichiang Tsai</i>	
A Path Diversity Metric for End-to-End Network.....	115
<i>Song Huang, Yong Xu, and Ling Zhang</i>	
The Eventual Leadership in Dynamic Mobile Networking Environments.....	123
<i>Jiannong Cao, Michel Raynal, Corentin Travers, and Weigang Wu</i>	
Fault-Tolerant Topology Control with Adjustable Transmission Ranges in Wireless Sensor Networks.....	131
<i>Chiu-Wen Chen, Kuo-Feng Ssu, and Hewijin Christine Jiau</i>	

Dependability Evaluation of Cooperative Backup Strategies for Mobile Devices .....	139
<i>Ludovic Courtès, Ossama Hamouda, Mohamed Kaániche, Marc-Olivier Killijian, and David Powell</i>	
Implementation of Highly Available OSPF Router on ATCA .....	147
<i>Chia-Tai Tsai, Rong-Hong Jan, Chien Chen, and Chia-Yuan Huang</i>	
Overlay Network Topology Reconfiguration in Byzantine Settings .....	155
<i>Rafael R. Obelheiro and Joni da Silva Fraga</i>	
A Randomized Distributed Algorithm for Peer-to-Peer Data Replication in Wireless Ad Hoc Networks .....	163
<i>Hong-Zu Chou, Szu-Chi Wang, and Sy-Yen Kuo</i>	
Fault Diagnosis for Time Synchronization in Sensor Networks.....	171
<i>Ke-Ting Chen, Kuo-Feng Ssu, and Wei-Tong Wang</i>	
Applied Self-Healing: Self-Aware Service Request Optimization for Gateway Stability in Ubiquitous Zone-Based Networks .....	179
<i>Junaid Ahsenali Chaudhry, Yonghwan Lee, Dugki Min, Seungkyu Park, Chun-Hyon Chang, and Duckwon Chung</i>	
A Fast Failure Detection and Failover Scheme for SIP High Availability Networks.....	187
<i>Wei-Ming Wu, Kuochen Wang, Rong-Hong Jan, and Chia-Yuan Huang</i>	
Assessment of Message Missing Failures in FlexRay-Based Networks.....	191
<i>Vahid Lari, Mehdi Dehbashi, Seyed Ghassem Miremadi, and Navid Farazmand</i>	
A Hybrid Redundancy Approach for Data Availability in Structured P2P Network Systems .....	195
<i>Guangping Xu, Gang Wang, and Jing Liu</i>	

## **Dependable Systems and Hardware**

A New Concurrent Detection of Control Flow Errors Based on DCT Technique.....	201
<i>Hung-Chuan Lai, Shi-Jinn Horng, Yong-Yuan Chen, Pingzhi Fan, and Yi Pan</i>	
Soft Error Rate Estimation in Deep Sub-micron CMOS .....	210
<i>Lianlian Zeng and Paul Beckett</i>	
Energy Saving Based on CPU Voltage Scaling and Hardware Software Partitioning .....	217
<i>Chia Hsiang Hsu, Cheng-Juei Yu, and Sheng-De Wang</i>	
Efficient BISR Techniques for Embedded Memories Considering Cluster Faults.....	224
<i>Chun-Lin Yang, Yuang-Cheng Hsiao, and Shyue-Kung Lu</i>	
A Fail-Silent Reconfigurable Superscalar Processor .....	232
<i>Thomas Kottke and Andreas Steininger</i>	

Improving Dependability Using Shared Supplementary Memory and Opportunistic Micro Rejuvenation in Multi-tasking Embedded Systems .....	240
<i>Vinaitheerthan Sundaram, Sandip HomChaudhuri, Sachin Garg, Chandra Kintala, and Saurabh Bagchi</i>	
An On-Line Control Flow Checking Method for VLIW Processor .....	248
<i>Shuming Chen, Xiao Hu, Biwei Liu, and Jihua Chen</i>	
Towards Byzantine Fault Tolerance in Many-Core Computing Platforms .....	256
<i>Casey M. Jeffery and Renato J. O. Figueiredo</i>	
Heterogeneous Functional Units for High Speed Fault-Tolerant Execution Stage.....	260
<i>Yousuke Nakamura and Kei Hiraki</i>	
A Low-Power and SEU-Tolerant Switch Architecture for Network on Chips.....	264
<i>A. Patooghy, M. Fazeli, and S. G. Miremadi</i>	
Power-Performance Trade-Off of a Dependable Multicore Processor .....	268
<i>Toshinori Sato and Toshimasa Funaki</i>	

## **Distributed Systems**

Examining Web-Based Spyware Invasion with Stateful Behavior Monitoring.....	275
<i>Ming-Wei Wu and Sy-Yen Kuo</i>	
A Process Group Membership Service for Active Safety Systems Using TT/ET Communication Scheduling .....	282
<i>Carl Bergenhem and Johan Karlsson</i>	
Boosting Database Replication Scalability through Partial Replication and 1-Copy-Snapshot-Isolation .....	290
<i>D. Serrano, M. Patiño-Martinez, R. Jimenez-Peris, and B. Kemme</i>	
PAI: A Lightweight Mechanism for Single-Node Memory Recovery in DSM Servers .....	298
<i>Jangwoo Kim, Jared C. Smolens, Babak Falsafi, and James C. Hoe</i>	
Self-Adjusting Indexing Techniques for Communication-Induced Checkpointing Protocols.....	306
<i>Jichiang Tsai, Chia-Yang Chen, Ming-Fa Hu, and Jenn-Wei Lin</i>	
RTG-L: Dependably Scheduling Real-Time Distributable Threads in Large-Scale, Unreliable Networks.....	314
<i>Kai Han, Binoy Ravindran, and E. D. Jensen</i>	
Benchmarking the Robustness of Web Services .....	322
<i>Marco Vieira, Nuno Laranjeiro, and Henrique Madeira</i>	
The Cost of Storing Checkpoints to Multiple Volatile Storage Locations Using at-least-k Semantics .....	330
<i>Andrew Maloney and Andrzej Goscinski</i>	

A Proposal of New Dependable Database Middleware with Consistency and Concurrency Control .....	334
<i>Takeshi Mishima and Hiroshi Nakamura</i>	
Improving Email Reliability by Sender Retransmission.....	338
<i>Tim Moors and Patrick Chu</i>	
Implementation of a Flexible Membership Protocol on a Real-Time Ethernet Prototype.....	342
<i>Raul Barbosa, António Ferreira, and Johan Karlsson</i>	
<b>Security Issues</b>	
MAPMon: A Host-Based Malware Detection Tool .....	349
<i>Shih-Yao Dai and Sy-Yen Kuo</i>	
Intrusion Tolerance in Wireless Environments: An Experimental Evaluation .....	357
<i>Henrique Moniz, Nuno Ferreira Neves, Miguel Correia, António Casimiro, and Paulo Verissimo</i>	
Testing and Comparing Web Vulnerability Scanning Tools for SQL Injection and XSS Attacks.....	365
<i>José Fonseca, Marco Vieira, and Henrique Madeira</i>	
Resilient Intrusion Tolerance through Proactive and Reactive Recovery.....	373
<i>Paulo Sousa, Alysson Neves Bessani, Miguel Correia, Nuno Ferreira Neves, and Paulo Verissimo</i>	
Information Security Fortification by Ontological Mapping of the ISO/IEC 27001 Standard.....	381
<i>Stefan Fenz, Gernot Goluch, Andreas Ekelhart, Bernhard Riedl, and Edgar Weippl</i>	
A Fault-Tolerant Bloom Filter for Deep Packet Inspection.....	389
<i>Myeong-Hyeon Lee and Yoon-Hwa Choi</i>	
Applying a Threshold Scheme to the Pseudonymization of Health Data .....	397
<i>Bernhard Riedl, Veronika Grascher, and Thomas Neubauer</i>	
On the Effects of Finite Memory on Intrusion-Tolerant Systems.....	401
<i>Giuliana Santos Veronese, Miguel Correia, Lau Cheuk Lung, and Paulo Verissimo</i>	
An Efficient Client-to-Client Password-Authenticated Key Exchange Resilient to Server Compromise .....	405
<i>Hongfeng Zhu, Tianhua Liu, Jie Liu, and Guiran Chang</i>	
<b>Author Index</b> .....	409