10th IEEE International Sy*m*posium Pacific Rim Dependable Computing - PRDC 2004
March 3-5, 2004 — Papeete, Tahiti, French Polynesia

Final Program

Wednesday		March 3, 2004
09H00-09H30	**Welcome Address and Introduction**	
09H30-10H30	**Keynote I: Reliability and Security: From Measurements to Design** *Ravishankar K. Iyer, Coordinated Science Laboratory, University of Illinois at Urbana Champaign, USA* Chair: Algirdas Avizienis, Vytautas Magnus University, Lithuania	
10H30-11H00	Coffee Break	
11H00-12H30	**Session 1A: Web and WAN Dependability** *Chair: William Sanders, University of Illinois at Urbana Champaign, USA* Towards Dependable Web Services *Markus Debusmann, Fachhochschule Wiesbaden; Kurt Geihs, TU Berlin; Germany* Failure Handling in a Reliable Multicast Protocol for Improving Buffer Utilization and Accommodating Heterogeneous Receivers *Gunjan Khanna, Saurabh Bagchi, Purdue University, West Lafayette, IN; John Rogers, Bank of AmericaCorporate, Charlotte, NC; USA* An Algorithmic Approach to Identifying Link Failures *Mohit V. Lad, Akash Nanavati, UCLA, Los Angeles, CA; Dan Massey, USC/ISI, Arlington, VA; Lixia Zhang, UCLA, Los Angeles, CA; USA*	**Session 1B: Practical Experience Reports I** *Chair: Sy-Yen Kuo, National Taiwan University, Taiwan* Cache Scrubbing in Microprocessors: Myth or Necessity? *Shubhendu S. Mukherjee, Joel Emer, Tryggve Fossum, Intel Corporation, Shrewsbury, MA; Steven K. Reinhardt, Intel Corporation, Shrewsbury, MA and University of Michigan, Ann Arbor; USA* Application-Level Fault Tolerance and Detection in the Orbital Thermal Imaging Spectrometer *Eric Ciocca, Israel Koren, Zahava Koren, C. Mani Krishna, University of Massachusetts, Amherst, MA; Daniel Katz, JPL, Pasadena, CA; USA* Error Detection Enhancement in COTS Superscalar Processors with Event Monitoring Features *Amir Rajabzadeh, Mirzad Mohandespour, Ghassem Miremadi, Sharif University of Technology, Teheran, Iran*
12H30-13H30	Lunch	
13H30–15h30	**Session 2A: Distributed Protocols and Systems** *Chair: Paulo Verissimo, Universidade de Lisboa, Portugal* A Hybrid Approach for Building Eventually Accurate Failure Detectors *Achour Mostefaoui, IRISA & University of Rennes; David Powell, LAAS-CNRS, Toulouse; Michel Raynal, IRISA & University of Rennes; France* Systematic Comparisons of RDT Communication-Induced Checkpointing Protocols *Jichiang Tsai, National Chung Hsing University, Taichung, Taiwan* On the Effects of Partial Membership Knowledge on Reliability of Gossip-based Multicast *Tatsuhiro Tsuchiya, Tohru Kikuno, Osaka University, Japan* Measuring Notification Loss in Publish/Subscribe Communication Systems *Roberto Baldoni, Roberto Beraldi, S. Tucci Piergiovanni, A. Virgillito, Università di Roma "La Sapienza", Italy*	**Session 2B: Software Reliability and Testing** *Chair: Yoshihiro Tohma, Tokyo Denki University, Japan* Safety Testing of Safety Critical Software Based on Critical Mission Duration *Shiping Yang, Nan Sang, Guangze Xiong, University of Electronic Science and Technology of China, Chengdu, China* Optimal Allocation of Testing-Resource Considering Cost, Reliability, and Testing-Effort *Chin-Yu Huang, National Tsing Hua University, Hsinchu; Jung-Hua Lo, Lan Yang Institute of Technology, I-Land; Sy-Yen Kuo, National Taiwan University, Taipei; Taiwan; Michael R. Lyu, Chinese University of Hong Kong, Shatin, Hong Kong* Quantifying the Variance in Application Reliability *Swapna Gokhale, University of Connecticut, Storrs, CT, USA* Software Rejuvenation Policies for Cluster Systems under Varying Workload *Wei Xie, Duke University, Durham, NC, USA; Yiguang Hong, ISS, Chinese Academy of Sciences, Beijing, China; Kishor S. Trivedi, Duke University, Durham, NC, USA*
15H30-16H00	Coffee Break	
16H00-17H30	**Session 3A: Checkpointing and Recovery** *Chair: Luca Simoncini, Università di Pisa, Italy* Using Modulo Rulers for Optimal Recovery Schemes in Distributed Computing *Kamilla Klonowska, Lars Lundberg, Håkan Lennerstad, Charlie Svahnber, Blekinge Institute of Technology, Ronneby, Sweden* Analysis of Read and Write Availability for Generalized Hybrid Data Replication Protocol *Masayuki Arai, Tabito Suzuki, Mamoru Ohara, Satoshi Fukumoto, Tokyo Metropolitan University, Tokyo, Japan; Hee Yong Youn, SungKyunKwan University, Korea* A Dynamic Checkpointing Scheme Based on Reinforcement Learning *Hiroyuki Okamura, Yuki Nishimura, Tadashi Dohi, Hiroshima University, Japan*	**Session 3B: Fast Abstracts I** *Chair: Takashi Nanya, University of Tokyo, Japan* [See last page for list of papers and ordering]
17H30-17H45	Break	
17H45-19H15	**Session 4A: Parallel & High-Performance Systems** *Chair: Saurabh Bagchi, Purdue University, USA* Availabilities and Costs of Reliable Fat-Btrees *Jun Miyazaki, Nara Institute of Science and Technology; Youhei Abe, ACCESS, Co., Ltd.; Haruo Yokota, Tokyo Institute of Technology; Tokyo; Japan* Node-to-Node Internally Disjoint Paths Problem in Bubble-Sort Graphs *Keiichi Kaneko, Yasuto Suzuki, Tokyo University of Agriculture and Technology, Japan* Fault-Tolerant Message Switching Based on Wormhole Switching and Backtracking *Manabu Sueishi, Masato Kitakami, Hideo Ito, Chiba University, Japan*	**Session 4B: Fast Abstracts II** *Chair: Wendy Bartlett, Hewlett-Packard, CA, USA* [See last page for list of papers and ordering]
20H00	**Gala Dinner**	

	Excursion
06H30-08H00	Visit of Papeete Market and Breakfast, at the invitation of Deputy-Mayor of Papeete
08H15-09H00	Visit of Pearl Museum
09H00-09H30	Transportation to Fishermen' Place (*Pointe des pêcheurs*)
09H30-11H30	Visit of Tahiti & Island Museum and traditional Cocktail, at the invitation of Minister of Culture and Research of the Territory
11H30-12H00	Return to Hotel
12H15-13H15	Lunch
13H15-14H15	**Keynote II: New Technologies, More Problems!** *Jacob A. Abraham, Computer Engineering Research Center, The University of Texas at Austin, USA* *Chair: Alain Costes, LAAS-CNRS, France*

14H15-15H15	**Session 5A: Distributed Systems Modeling** *Chair: Kishor Trivedi, Duke University, USA* Reliability Evaluation of Dependable Distributed Computing Systems Based on Recursive Merge and BDD *Yung-Ruei Chang, Hung-Yau Lin, Sy-Yen Kuo, National Taiwan University, Taipei, Taiwan* Expected-Reliability Analysis for Wireless CORBA with Imperfect Components *Xinyu Chen, Michael Lyu, Chinese University of Hong-Kong, Shatin, Hong-Kong*	**Session 5B: Coding** *Chair: Jan Torin, Chalmers University of Technology, Sweden* Nonsystematic M-Ary Asymmetric Error Correcting Codes Designed by Multilevel Coding Method *Haruhiko Kaneko, Mariko Numakami, Eiji Fujiwara, Tokyo Institute of Technology, Japan* Protecting Wavelet Lifting Transforms *Robert Redinbo, Cung Nguyen, University of California Davis, CA, USA*

15H15-15H45	Coffee Break

15H45-16H45	**Session 6A: Mobile Systems and Networks** *Chair: John Meyer, University of Michigan, USA* Connecting Network Partitions with Location-Assisted Forwarding Nodes in Mobile Ad Hoc Environments *Chia-Ho Ou, Kuo-Feng Ssu, Hewijin Christine Jiau, National Cheng Kung University, Tainan, Taiwan* Analysis and Evaluation of Topological and Application Characteristics of Unreliable Mobile Wireless Ad-hoc Network *Serdar Cabuk, Nipoon Malhotra, Longbi Lin, Saurabh Bagchi, Ness Shroff, Purdue University, West Lafayette, IN, USA*	**Session 6B: Dependability Benchmarking** *Chair: Günter Heiner, DaimlerChrysler, Germany* Benchmarking Operating System Dependability: Windows 2000 as A Case Study *Ali Kalakech, Tahar Jarboui, Jean Arlat, Yves Crouzet, Karama Kanoun, LAAS-CNRS, Toulouse, France* The System Recovery Benchmark *James Mauro, Ji Zhu, Ira Pramanick, Sun Microsystems, Santa Clara, CA, USA*

16H45-17H00	Break
17H00-18H00	**Presentations by *GIE Tourisme***
18H00	Cocktail offered by the Minister of Post and New Technologies, and the President of the Council of OPT Group

08H30-10H00	**Session 7A: Fault Tolerance** *Chair: Philip Koopman, Carnegie Mellon University, USA* Aspects for Improvement of Performance in Fault-Tolerant Software *Diana Szentivanyi, Simin Nadjm-Tehrani, Linköping University, Linköping, Sweden* A Freshness Detection Mechanism for Railway Applications *Andrea Bondavalli, Enrico De Giudici, University of Florence; Stefano Porcarelli, ISTI-CNR, Pisa; Salvatore Sabina, Fabrizio Zanini, Ansaldo Segnalamento Ferroviario, Genova; Italy* RedCAN: Simulations of Two Fault Recovery Algorithms for CAN *Håkan Sivencrona, SP Swedish National Testing & Research Institute, Borås; Torbjörn Olsson, Sauer-Danfoss, Älmhul; Roger Johansson, Jan Torin, Chalmers University, Goteborg, Sweden*	**Session 7B: Practical Experience Reports II** *Chair: Robert Redinbo, University of California Davis, USA* Evaluation of Memory Built-In Self Repair Techniques for High Defect Density Technologies *Lorena Anghel, TIMA; Nadir Achouri, Michael Nicolaidis, IROC Technologies; Grenoble, France* Efficient Built-in Self-Test Techniques for Memory-Based FFT Processors *Shyue-Kung Lu, Chien-Hung Yeh, Han-Wen Li, National Taiwan University, Taipei, Taiwan* Evaluation of Fault-Tolerant Designs Implemented on SRAM-Based FPGAs *Ghazanfar Asadi, Seyed Ghassem Miremadi, Hamid R. Zarandi, Alireza Ejlali, Sharif University of Technology, Teheran, Iran*
10H00-10H30	Coffee Break

10H30-12H00	**Panel on High Performance Computing in Dependable Space Systems**
	
	 Organizer: *Raphael Some, Jet Propulsion Laboratory, CA, USA*
	 Panelists:
	    Algirdas Avizienis, Vytautas Magnus University, Lithuania
	    Jiri Gaisler, Gaisler Research, Göteborg, Sweden
	    Hirokazu Ihara, Tokyo Denki University, Japan
	    Shubu Mukherjee, Intel Corporation, Shrewsbury, MA, USA
	    Neeraj Suri, TU Darmstadt, Germany

12H00-13H00	Lunch
13H00-15H00	**Session 8A: Validation and Modeling** *Chair: Tohru Kikuno, Osaka University, Japan* Improving AI Systems' Dependability by Utilizing Historical Knowledge *Rainer Knauf, Technical University of Ilmenau, Germany; Setsuo Tsuruta, Hirokazu Ihara, Tokyo Denki University, Japan; Avalino J. Gonzalez, University of Central Florida, FL, USA; Torsten Kurbad, TK-WebArt, Germany* Representing User Workarounds as A Component of System Dependability *Christopher Martin, Bosh Research & Technology Center; Philip Koopman, Carnegie Mellon University; PA, USA* Stochastic Petri Nets and Inheritance for Dependability Modelling *Simona Bernardi, Susanna Donatelli, Universita di Torino, Italy* Dependability Analysis of a Class of Probabilistic Petri Nets *Hsu-Chun Yen, Lien-Po Yu, National Taiwan University, Taipei, Taiwan*	**Session 8B: Practical Experience Reports III** *Chair: Jean-Claude Laprie, LAAS-CNRS, France* Honeypots: A Practical Mean to Validate Malicious Fault Assumptions on the Internet *Marc Dacier, Fabien Pouget, Eurécom, Sophia Antipolis; Hervé Debar, FranceTelecom R&D, Caen; France* Ferret: A Host Vulnerability Checking Tool *Anil Sharma, University of Maryland at College Park; Jason R. Martin, University of Illinois at Urbana-Champaign, IL; Nitin Anand, Michel Cukier, University of Maryland at College Park; William Sanders, University of Illinois at Urbana-Champaign, IL; USA* Windar: A Multithreaded Rollback-recovery Toolkit on Windows *Jinmin Yang, Dafang Zhang, Zhang Qin, Hunan University, China; Xue-Dong Yang, University of Regina, Canada* Periodic Partial Validation: Cost-effective Source Code Validation Process in Cross-platform Software Development Environment *Sheng Li, Jun Xu, Lijun Deng, Cisco Systems Ltd., USA*
15H00-15H30	Coffee Break
15H30-16H30	Meeting of PRDC Steering Committee *Sy-Yen Kuo, National Taiwan University, Taipei, Taiwan*
16H30	End of the Symposium

Session 3B: Fast Abstracts I

Chair: Takashi Nanya, The University of Tokyo, Japan

Incorporating Application-Level Fault Tolerance and Detection into Radar Angular Super-Resolution
Hua Yang, Beijing Institute of Control Engineering, China; Israel Koren, C.M. Krishna, University of Massachusetts, Amherst, USA

EWS: A Mini Dependable Computer System for Non-PC Devices
Guang-jie Han, Northeastern University, Shenyang; Ling-yu Xu, Shanghai University; Mo Guan, and Hai Zhao, Northeastern University, Shenyang; China

Design of a Fault-Tolerant Real-Time Embedded Operating System: WebitOS
Jindong Wang, Northeastern University, Shenyang; Lingyu Xu, Shanghai University; Hai Zhao, Guangjie Han, Northeastern University; China

An Economic Design of the k-out-of-n Reactor Protection System
Dong-Young Lee, Jai-Bok Han, Korea Atomic Energy research Institute; Joon Lyou, Chungnam National University; Korea

A Concept of a Data-Oriented Dependable Interlocking System
Sei Takahashi, Hideo Nakamura, Nihon University, Japan

An Implementation of System-Level Dependable Architecture for Industrial Embedded Computing Systems
R.Pitchiah, L.M.Patnaik, S.K.Sinha, Indian Institute of Science; David SelvaKumar, P.K.Sinha, Center for Development of Advanced Computing; Bangalore, India

A Search Mechanism on a Distributed Virtual World: Six-Direction Simultaneous Search
Jui-Fa Chen, TamKang University; Wei-Chuan Lin, E-Commerce Center, Tak-Ming College; Chih-Yu Jian, Heng-Yi Chiou, TamKang University; Taiwan

Defining Semantic Guideline in XML-Based Programmable Service Environment
Pattara Leelaprute, Osaka University; Masahide Nakamura, Kenichi Matsumoto, Nara Institute of Science & Technology; Tohru Kikuno, Osaka University; Japan

An Enterprise Knowledge Management Approach to Software Development
Hasnain Zafar Baloch, Mamadou Bobo Sylla, Multimedia University, Malaysia

Collective Mind Approach to Active State Model
Michail Zak, Jet Propulsion Laboratory and California Institute of Technology, USA

Ensuring Resource Availability for Reliable Job Completion on a Grid
N. G. Aparna, Srividya Gopalan, V. Sridhar , Satyam Computer Services Ltd., Bangalore, India

On the Composability of Transactional Attributes
Ricardo Jimenez-Peris, Marta Patino-Martinez, Universidad Politécnica de Madrid, SPAIN

Session 4B: Fast Abstracts II

Chair: Wendy Bartlett, Hewlett Packard, USA

Byzantine-Resistant Consensus Based on a Novel Approach to Intrusion Tolerance
M. Correia, N. F. Neves, Faculdade de CiênciasdaUniversidade de Lisboa, Portugal; L. C. Lung, Pontificia Universidade Católica do Paranà, PradoVelho, Brazil; P. Verissimo, Faculdade de Ciênciasda Universidade de Lisboa, Portugal

An Infrastructure for Efficient and Reliable Network Intrusion Detection
Thomas Holz, PACE Aerospace Engineering and Information Technology GmbH, Berlin, Germany

CMEA - Compromise Modes and Effects Analysis for Information Systems
Rico R. Valdez, Hunter Provyn, BBN technologies, USA

Protecting EBCOT Encoding System for JPEG2000
Cung Nguyen, G.Robert Redinbo, University of California Davis, USA

A Faster Checkpointing and Recovery Algorithm on SCore Environment
Wen Gao, Takuro Hayashida, Masaaki Kondo, Hiroshi Nakamura, Takashi Nanya, Research Center for Advanced Science and Technology, the University of Tokyo, Japan

TMR Algorithms for Duplex Systems
Mamoru Ohara, Masayuki Arai, Satoshi Fukumoto, Kazuhiko Iwasaki, Tokyo Metropolitan University, Japan A Faster

On Omega in Sparse Networks
Martin Hutle, Vienna University of Technology, Austria

A Framework for Validating EPIC Code
Rohit Kundaji, R. K. Shyamasundar, Tata Institute of Fundamental Research, Mumbai, India

Test Architecture Exploration on Reconfigurable Scan Chain Network
Makoto Sugihara, Institute of Systems & Information Technologies/KYUSHU; Kazuaki Murakami, Communication Engineering, Kyushu University; Japan

Behavioral Fault Simulation for VHDL Description Using DEVS Formalism
Laurent Capocchi, Dominique Federici, Fabrice Bernardi, Paul Bisgambiglia, University of Corsica, France

DSSV-Methodology for the Validation on High Level of the Software Specification
Emmanuelle de Gentili, Jean François Santucci, Dominique Federici, Paul Antoine Bisgambiglia, , University of Corsica, France