

2011 IEEE/IFIP 41st International Conference on Dependable Systems and Networks Workshops

(DSN-W 2011)

**Hong Kong, China
27 – 30 June 2011**



IEEE Catalog Number: CFP1141K-PRT
ISBN: 978-1-4577-0374-4

WRAITS Program

5th Workshop on Recent Advances in Intrusion-Tolerant Systems (WRAITS)

Monday – June 27th, 2011

Introduction.....1

Alysson Bessani (University of Lisboa, Portugal), Partha Pal (BBN Technologies, USA)

Session 1: Distributed Systems

The Time-Free Approach to Byzantine Failure Detection in Dynamic Networks.....3

*Murilo Santos de Lima, Fabíola Greve (UFBA, Brazil), Luciana Arantes and
Pierre Sens (INRIA, France)*

Managing Business Health in the Presence of Malicious Attacks9

Saman A. Zonouz, Aashish Sharma (University of Illinois, USA), HariGovind V. Ramasamy (IBM Research, USA), Zbigniew T. Kalbarczyk (University of Illinois, USA), Birgit Pfitzmann, Kevin McAuliffe (IBM Research, USA), Ravishankar K. Iyer, William H. Sanders (University of Illinois, USA) and Eric Cope (IBM Research, USA)

From Byzantine Fault Tolerance to Intrusion Tolerance (A Position Paper).....15

Alysson Bessani (University of Lisboa, Portugal)

WRAITS Program

Session 2: Intrusion Detection and Response

Anomaly-Based Intrusion Detection in Software as a Service.....19

Gustavo Nascimento (Portugal Telecom , Portugal) and Miguel Correia (University of Lisboa, Portugal)

Combining Intrusion Detection and Recovery for Enhancing System Dependability25

Ajay Nagarajan, Quyen Nguyen, Robert Banks and Arun Sood (George Mason University, USA)

A Cloud-Based Intrusion Detection and Response System for Mobile Phones31

Amir Houmansadr, Saman A. Zonouz and Robin Berthier (University of Illinois, USA)

Session 3: Security Assessment

Continuous Mission-Oriented Assessment (CMA) of Assurance.....33

Patrick Hurley (Air Force Research Laboratory, USA), Partha Pal (BBN Technologies, USA), Mathew Tan Creti (Purdue University, USA), and Amy Fedyk (BBN Technologies, USA)

Guest Talk: Empirical Studies in Cybersecurity

Michel Cukier (Raytheon Company, USA)

WDSN Program

5th Workshop on Dependable and Secure Nanocomputing (WDSN)

Monday – June 27th, 2011

Introduction.....39

Jean Arlat (LAAS-CNRS and Université de Toulouse), Cristian Constantinescu (AMD), Johan Karlsson (Chalmers University of Technology, Sweden), Takashi Nanya, (Canon Inc., Japan) Alan Wood, (Oracle, , USA)

Session 1: Failure Modes

Study of the Effects of SET Induced Faults on Submicron Technologies41

Alireza Rohani, Hans G. Kerkhoff (University of Twente, The Netherlands)

Investigating the Impact of Process Variations on an Asynchronous Time-Triggered-Protocol Controller47

Markus Ferringer (Vienna University of Technology, Austria)

Comparing the Effects of Intermittent and Transient Hardware Faults on Programs.....53

Jiesheng Wei, Layali Rashid, Karthik Pattabiraman, Sathish Gopalakrishnan (The University of British Columbia, Canada)

Session 2: Stochastic Computing & Time Redundancy Techniques

Keynote Talk: Stochastic Computing: Embracing Errors in Architecture and Design of Processors and Applications

Rakesh Kumar, (University of Illinois at Urbana-Champaign, USA)

Level of Confidence Evaluation and Its Usage for Roll-back Recovery with Checkpointing Optimization59

Dimitar Nikolov, Urban Ingelsson (Linköping University, Sweden), Virendra Singh (Indian Institute of Science, India), Erik Larsson (Linköping University, Sweden)

WDSN Program

Session 3: Mitigation Techniques

A Digitalized Management Mechanism for Low-cost Low-Power Multiple-Voltage 3D Designs**65**

Ching-Hwa Cheng, Ming-Hsuan Wu, Pin-Jui Lai, Chia-Hao Ku, (Feng Chia University, Taiwan)

An Efficient and Reliable 1.5-way Processor by Fusion of Space and Time Redundancies.....**69**

Jun Yao, Ryoji Watanabe, Kazuhiko Yoshimura, Takashi Nakada, Hajime Shimada, Yasuhiko Nakashima (Nara Institute of Science and Technology, Japan)

A Non-Volatile Microcontroller with Integrated Floating-Gate Transistors**75**

Wing-Kei Yu, Shantanu Rajwade, Sung-En Wang, Bob Lian, G. Edward Suh, Edwin Kan (Cornell University, USA)

Session 4: Testing & Fault Injection

Built-In Fine Resolution Clipping with Calibration Technique for

High-Speed Testing by Using Wireless Testers.....**81**

Ching-Hwa Cheng, Chen-I Chung (Feng-Chia University, Taichung, Taiwan)

Genetic Algorithm Based Approach for Segmented Testing.....**85**

Xiaoxin Fan, Sudhakar M. Reddy (University of Iowa, USA), Senling Wang, Seiji Kajihara, Yasuo Sato, (Kyushu Institute of Technology, Japan)

Model-Based Fault Injection for Failure Effect Analysis – Evaluation of Dependable SRAM for Vehicle Control Units**91**

Yohei Nakata (Kobe University, Japan), Yasuhiro Ito, Yasuo Sugure, Shigeru Oho (Hitachi, Ltd., Japan), Yusuke Takeuchi, Shunsuke Okumura, Hiroshi Kawaguchi (Kobe University, Japan), Masahiko Yoshimoto (Japan Science and Technology Agency, CREST, Japan)

DCDV Program

1st International Workshop on Dependability of Clouds, Data Centers and Virtual Computing Environments (DCDV)

Monday – June 27th, 2011

Introduction.....	97
<i>Jogesh K. Muppala, (HKUST, Hong Kong), Matti Hiltunen, (AT&T Labs-Research, USA), Robert Stroud, (City University, London, UK), Ji Wang, (NLPDP, NUDT, China)</i>	

Session 1: Distributed Data

CAWRM:A Remote Mirroring System Based on AoDI Volume.....	99
<i>Zhenhai Zhao, Tingting Qin, Fangliang Xu, Rui Cao, Xiaoguang Liu, Gang Wang (Nankai University, China)</i>	

An Epidemic Approach to Dependable Key-Value Substrates	105
<i>Miguel Matos, Ricardo Vilaça, José Pereira, Rui Oliveira (Universidade do Minho, Portugal)</i>	

Session 2: Security

The Case for Dynamic Security Solutions in Public Cloud Workflow Deployments	111
<i>John Charles Mace, Aad van Moorsel and Paul Watson (Newcastle University, UK)</i>	

Recursive Virtual Machines for Advanced Security Mechanisms	117
<i>Bernhard Kauer, Paulo Verissimo, and Alysson Bessani (Universidade de Lisboa, Portugal)</i>	

DCDV Program

Designing SCIT Architecture Pattern in a Cloud-based Environment.....	123
<i>Quyen Nguyen, Arun Sood (George Mason University, USA)</i>	

Session 3: Failure Detection and Security

Lucy in the Sky without Diamonds: Stealing Confidential Data in the Cloud.....	129
<i>Francisco Rocha and Miguel Correia (Universidade de Lisboa, Portugal)</i>	

Online Detection of Performance Problems in Large-Scale Cloud Computing Systems	135
<i>Haibo Mi, Huaimin Wang, Gang Yin (NUDT, China), Hua Cai, Qi Zhou, and Tingtao Sun (Alibaba, China)</i>	

Identify Faults in Large-Scale Distributed Systems by Filtering Noisy Error Logs.....	140
<i>Xiang Rao, Huaimin Wang, Dianxi Shi, Zhenbang Chen (NUDT, China), Hua Cai, Qi Zhou, and Tingtao Sun, (Alibaba, China)</i>	

Session 4: Cloud Resource Management

Enhancing Application Robustness in Infrastructure-as-a-Service Clouds	146
<i>Madalin Mihailescu, Andres Rodriguez, Cristiana Amza (University of Toronto, Canada)</i>	

Power-Performance Trade-offs in IaaS Cloud: A Scalable Analytic Approach	152
<i>Rahul Ghosh, (Duke University, USA), Vijay Naik, (IBM, USA), Kishor Trivedi (Duke University, USA)</i>	

A Virtual Resource Placement Service	158
<i>Richard E. Harper, Lorrie Tomek, (IBM, USA) Ofer Biran, and Erez Hadad, (IBM, Israel)</i>	

HotDep Program

7th Workshop on Hot Topics in System Dependability (HotDep)

Monday – June 27th, 2011

Introduction.....	164
<i>Andreas Haeberlen, (University of Pennsylvania, USA), Mootaz Elnozahy, (IBM Research - Austin, USA)</i>	

Session 1: Dependable Storage

Integrated End-to-End Dependability in the Loris Storage Stack.....	165
<i>David C. van Moolenbroek, Raja Appuswamy, and Andrew S. Tanenbaum, (Vrije Universiteit, Amsterdam)</i>	

Scalable Byzantine Fault-Tolerant Storage.....	171
<i>Ricardo Padilha and Fernando Pedone, (University of Lugano, Switzerland)</i>	

Lock-free Transactional Support for Large-scale Storage Systems.....	176
<i>Flavio Junqueira, Benjamin Reed and Maysam Yabandeh (Yahoo! Research, USA)</i>	

Session 2: Security

TO BEncmark or NOT TO BEncmark Security: That is the question	182
<i>Afonso Araújo Neto and Marco Vieira, (University of Coimbra, Portugal)</i>	

Automated Vulnerability Discovery in Distributed Systems.....	188
<i>Radu Banabic, George Candea, and Rachid Guerraoui, (EPFL, Switzerland)</i>	

HotDep Program

- Limiting Cached-based Side-Channel in Multi-tenant Cloud using Dynamic Page Coloring.....194**
Jichen Shi, Xiang Song, Haibo Chen, and Binyu Zang, (Fudan University, China)

Session 3: System and Software Reliability

- Exterminating Bugs via Collective Information Recycling.....200**
George Canea, (EPFL, Switzerland)

- Platform-wide Deadlock Immunity for Mobile Phones205**
Horatiu Jula, Thomas Rensch, and George Canea, (EPFL, Switzerland)

- Enabling Sophisticated Analyses of x86 Binaries with RevGen211**
Vitaly Chipounov and George Canea, (EPFL, Switzerland)

Session 4: Architectural Support for Dependability

- Secure MMU: Architectural Support for Memory Isolation among Virtual Machines.....217**
Seongwook Jin and Jaehyuk Huh, (KAIST, Korea)

- Transactional Memory for Dependable Embedded Systems.....223**
Christof Fetzer, (TU Dresden, Germany) and Pascal Felber, (University of Neuchatel, Switzerland)

WOSD Program

1st International Workshop on Open Systems Dependability : Adaptation to Changing World (WOSD)

Monday – June 27th, 2011

Introduction.....228

Mario Tokoro, (Sony CSL, Inc., Japan), Karama Kanoun (LAAS-CNRS, France), Kimio Kuramitsu, (Yokohama National University, Japan) and Jean-Charles Fabre (LAAS-CNRS, France)

Guest Talk: Dealing with uncertainty to ensure open system dependability

Alexander (Sascha) Romanovsky (Newcastle University)

Session 1: Applications

On Finding Vestiges of Internet Backbone Failures for Optimizing Wide Area Data Replication230

Hirotake Abe (Osaka University, Japan), Hirotaka Moriya and Kyoji Umemura (Toyohashi University of Technology, Japan)

Performance Modeling and Benchmarking of Bank Intermediary Business on High-Performance Fault-Tolerant Computers234

Bo Li, Haiying Zhou, Decheng Zuo, Zhan Zhang, Peng Zhou and Long Jia (Harbin Institute of Technology Harbin, China)

Composite Dependability Modeling for In-vehicle Networks.....240

Hiroyuki Okamura, Tadashi Dohi, Shin'ichi Shiraishi and Mutsumi Abe (Hiroshima University, Japan)

WOSD Program

Session 2: System and Architecture

Architecting Resilient Computing Systems: Overall Approach and Open Issues	246
<i>Jean-Charles Fabre (LAAS-CNRS, France)</i>	
Fault Model of Foreign Function Interface across Different Domains	248
<i>Shinpei Nakata (Yokohama National University, Japan), Midori Sugaya and Kimio Kuramitsu (Yokohama National University, JST/CREST, Japan)</i>	
Enforcing Dependable Operations by Model Checking a Virtualization Layer	254
<i>Shuichi Oikawa (Tsukuba University, Japan)</i>	

Panel Session

How Can We Cope with the Incompleteness and Uncertainty In the Changing World?

Mario Tokoro (Sony Computer Science Laboratory, Japan)

PFARM Program

3rd Workshop on Proactive Failure Avoidance, Recovery, and Maintenance (PFARM)

Monday – June 27th, 2011

Introduction.....	257
<i>Miroslaw Malek, Felix Salfner (Humboldt University, Germany), Kishor S. Trivedi (Duke University, USA)</i>	

Session 1:

Practical Online Failure Prediction for Blue Gene/P: Period-based vs Event-driven.....	259
---	------------

Li Yu, Ziming Zheng, Zhiling Lan (Illinois Institute of Technology, USA) and Susan Coghlan (Argonne National Laboratory, USA)

Detecting Resource Leaks through Dynamical Mining of Resource Usage Patterns	265
---	------------

Huxing Zhang, Gang Wu (Shanghai Jiao Tong University, China), Kingsum Chow, Zhidong Yu and Xuezhi Xing (Intel Corporation, China)

DynaPlan: Resource Placement for Application-Level Clustering.....	271
---	------------

Richard E. Harper, Kyung Dong Ryu, David Frank, Lisa Spainhower, Ravi Shankar and Tom Weaver (IBM, USA)

Session 2: Invited Talks

Guest Talk: Proactivity = Observation + Analysis + Knowledge extraction + Action planning?

András Pataricza, (Budapest University of Technology and Economics, Hungary)

ADAMUS Program

5th International workshop on Adaptive and Dependable Mobile Ubiquitous Systems (ADAMUS)

Monday – June 27th, 2011

Introduction.....	278
<i>Domenico Cotroneo (Universita' degli Studi di Napoli Federico II, Italy) Vincenzo De Florio, (University of Antwerp, Belgium)</i>	

Session 1:

Adaptive Collaborative Sensing using Mobile Phones and Stationary Sensors	280
<i>Edith C.-H. Ngai (Uppsala University, Sweden), and Junjie Xiong (Chinese University of Hong Kong, China)</i>	

Enabling On-Line Dependability Assessment of Android Smart Phones	286
<i>Marcello Cinque (Universita' degli Studi di Napoli Federico II, Italy)</i>	

Session 2:

A Novel Design of Node-disjoint Multi-path QoS Routing in Multi-hop Ad Hoc Networks.....	292
<i>Szu-Lin Su, Yi-Wen Su (National Cheng Kung University, Taiwan), Chien-Sheng Chen (Tainan University of Technology, Taiwan), and Wen-Hsiung Liu (Aletheia University, Taiwan)</i>	

Privacy Leakage in Two-Party Group Nearest Neighbor Queries	297
<i>Yan Huang, Cai Chen (University of North Texas, USA)</i>	

Closing Panel: Open Issues on Experimental Dependability Evaluation of Mobile Ubiquitous Systems

Moderator: Domenico Cotroneo (Universita' degli Studi di Napoli Federico II, Italy)
