The 20th IEEE Pacific Rim International Symposium on Dependable Computing (PRDC 2014)

Singapore
Nov 19-21, 2014
Welcome Message from the Organising Committee

Welcome to PRDC 2014, the twentieth in this series of symposia started in 1989 that are devoted to dependable and fault-tolerant computing and welcome to Singapore! PRDC 2014 aims to continue the tradition to advance the understanding and expertise in the following areas:

- Software and hardware reliability, testing, verification, and validation
- Dependability measurement, modeling, evaluation, and tools
- Self-healing, self-protecting, and fault-tolerant systems
- Software aging and rejuvenation
- Safety-critical systems and software
- Architecture and system design for dependability
- Fault-tolerant algorithms and protocols
- Reliability in cloud computing, Internet, and web systems and applications
- Cloud and Internet Information security
- Dependability issues in computer networks and communications
- Dependability issues in distributed and parallel systems
- Dependability issues in real-time systems, database, and transaction processing systems
- Dependability issues in autonomic computing
- Dependability issues in aerospace and embedded systems

This year’s conference has a strong technical program. In addition to 3 keynote addresses by Aditya P Mathur, Min Xie and Roberto Baldoni, it also includes a selection of rigorously refereed papers presented in the regular paper sessions and short paper sessions. The Program Committee has received 64 submissions from 25 countries and each paper was reviewed by at least 3 referees. We choose 24 full papers, 1 industry paper, 5 fast abstracts and 1 poster as the result of intensive discussions held among the PC members.

We would like to thank National University of Singapore, Nanyang Technological University, and Singapore University of Technology & Design as co-organisations. Special thanks go to many individuals who have contributed to the success of this conference. We thank the authors for sharing their ideas with us, the reviewers for providing valuable feedback, and all the PC members for taking time from their busy schedules to support this conference. We would like to thank Takashi Nanya and Min Xie who provided many excellent help in organising this conference. Special thanks also go to various organization committee members/chairs and special guests: Shang-Wei Lin, Yuan Fang Li, Tian Huat Tan, Ling Shi, Manchun Zheng, Yuzhang Feng, Hai Wang, Songzheng Song and Zhimin Wu.

Thank you for attending PRDC 2014. We hope that you enjoy the program and have a great stay in Singapore!

Yang Liu and Nobuyasu Kanekawa (Program Co-Chairs)
Jin Song Dong and Jun Sun (General Co-Chairs)
Social Events

**Excursion at Garden By the Bay**
*Date & Time: 15:50-18:30, 20 Nov. 2014*

**Location:** Garden By the Bay

**Address:** 18 Marina Gardens Dr, 018953

**Transportation:** The free shuttle bus will leave from NUS COM2 at 3:50pm.

*Introduction:* Garden by the Bay is a park spanning 101 hectares of reclaimed land in central Singapore, adjacent to the Marina Reservoir. The park consists of three waterfront gardens: Bay South Garden, Bay East Garden and Bay Central Garden. The largest of the three gardens is Bay South Garden, standing at 54 hectares.

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**Conference Banquet**
*Date & Time: 18:30–21:30, 20 Nov. 2014*

**Location:** Todai (Japanese Buffet)

**Address:** 2 Bayfront Ave, Singapore 018972

**Transportation:** Will walk from Garden By the Bay at 6:30 pm. The free shuttle bus will leave to hotel at 9:45pm.
PRDC 2014 Program

19 Nov, 2014

Opening
08:45-09:00, Location: Executive Classroom

Keynote Speaker 1: 09:00-10:00

| [Keynote1] | Aditya P Mathur |
| Title | Quantifying the Security of Cyber Physical Systems |
| Time and Date | 09:00-10:00, Wednesday, 19 Nov, 2014 |
| Room | Executive Classroom |
| Chair | Takashi Nanya |

Morning Tea Break: 10:00-10:30

Session 1: Fault Tolerant
10:30-12:10, Location: Executive Classroom
Chair: Nobuyasu Kanekawa

A Fault Tolerant Architecture For Data Fusion Targeting Hardware and Software Faults.
BADER Kaci, LUSSIER Benjamin, SCHÖN Walter

Design of Multi-Threaded Fault-Tolerant Connection-Oriented Communication.
Filipe João Boavida Mendonça Machado Araújo, Fernando J. Barros

A Software-Implemented Fault-Tolerance Approach for Control and Display Systems in Avionics.
Camille Fayollas, Jean-Charles Fabre, Philippe Palanque, Martin Cronel, David Navarre, Yannick Deleris

Study on Routing Protocol for Structured P2P Network Taking Account of the Nodes Which Behave Like a Byzantin Fault (Fast Abstract and Poster)
Satoshi Fukumoto, Tomoki Endo, Mamoru Ohara, Masayuki Arai

Lunch: 12:10-14:00

Session 2A (14:00-15:30): Security Systems
Location: Executive Classroom
Chair: Yang Liu

Automatic Generation of Security Argument Graphs.

Session 2B (14:00-15:30): Hardware
Location: Multipurpose Space
Chair: Takashi Nanya

Reduction of NBTI-Induced Degradation on Ring Oscillators in FPGA.
Yasuo Sato, Masafumi Monden, Yousuke Miyake, Seiji Kajihara
Towards Secure and Dependable Authentication and Authorization Infrastructures.
Diego Kreutz, Alysson Bessani, Eduardo Feitosa, Hugo Cunha

Protecting RAID Arrays Against Unexpectedly High Disk Failure Rates.
Jehan-François Pâris, Thomas Schwarz, S. J., Ahmed Amer, Darrell D. E. Long

Lightweight Bare-metal Stateful Firewall.
Yihuan Xing, Ford Long Wong, Akash Kumar

Saeideh Alinezhad Chamazcoti, Seyed Ghassem Miremadi

Ivano Irrera, Marco Vieira

Joseph Callenes-Sloan, Hugh McNamara

Exploiting Synchronicity for Immediate Feedback in Self-Stabilizing PIF Algorithms
Oday Jubran. Oliver Theel

From Safety Analyses to Experimental Validation of Automotive Embedded Systems.
Ludovic PINTARD, Jean-Charles FABRE, Michel LEEMAN, Karama Kanoun, Matthieu Roy

Patrick Graydon, Iain Bate

FoxyFeed: Forging Device-level Asynchronous Events for Kernel Development.
Kenji Kono, Shunsuke Miyahara, Hiroshi Yamada, Takeshi Yoshimura

Locating a Faulty Interaction in Pair-Wise Testing (Fast Abstract and Poster).
Takahiro Nagamoto, Hideharu Kojima, Hiroyuki Nakagawa, Tatsuhiro Tsuchiya

Simulation of software fault detection and correction processes considering different skill levels of debuggers (Fast Abstract and Poster).
Rui Peng, F.R. Shahrzad

Codes Correcting Asymmetric/Unidirectional Errors along with Bidirectional Errors of Small Magnitude (Fast Abstract and Poster).
Shohei Kotaki, Masato Kitakami
Keynote Speaker 2: 09:00-10:00

Roberto Baldoni
From Perimetral Defense to Immune Systems: Protecting the National Cyber Space
09:00-10:00, Thursday, 20 Nov, 2014
Executive Classroom
Jin Song Dong

Morning Tea Break: 10:00-10:30

Session 4: Cloud
10:30-12:10
Location: Executive Classroom
Chair: Guojun Wang

Computing Defects Per Million in Cloud caused by Virtual Machine Failures with Replication
Subrota K. Mondal, Jogesh K. Muppala, Fumio Machida, Kishor S. Trivedi

Reliability of Geo-Replicated Cloud Storage Systems
Ilias Iliadis, Dmitry Sotnikov, Paula Ta-Shma, Vinodh Venkatesan

CloudBFT: Elastic Byzantine Fault Tolerance
Rodrigo Nogueira, Filipe Araujo, Raul Barbosa

Formalizing Google File System (Fast Abstract and Poster)
Mengdi Wang, Bo Li, Yongxin Zhao, Geguang Pu

Lunch: 12:10-14:00

SC meeting: 12:00-14:00, COM2-03-15 - Discussion Rm 8 @ COM2 (invitation only)

Session 5: Software Quality 14:00-15:40
Location: Executive Classroom
Chair: Min Xie

Efficient VM Introspection in KVM and Performance Comparison with Xen.
Kenichi Kourai, Kousuke Nakamura

Region-Adherent Algorithms: Restricting the Impact of Faults on Service Quality.
Jan Steffen Becker, Dilshod Rahmatov, Oliver Theel

Toshitaka Koga, Tadashi Dohi, Hiroyuki Okamura

Optimization of Partitioned Architectures to Support Soft Real-Time Applications (Fast Abstract and Poster).
Domitian Tamas-Selicean, Paul Pop

15:50-18:30: Excursion at Garden By the Bay

18:30: Conference Banquet at MBS- Todai
Md Zakirul Alam Bhuiyan, Guojun Wang

Responsiveness of Service Discovery in Wireless Mesh Networks.
Andreas Dittrich, Daniel Solis Herrera, Pablo Coto, Miroslaw Malek

Reasoning about Group-Based Mobility in MANETs.
Xi Wu, Si Liu, Huibiao Zhu, Yongxin Zhao

Closing and Lunch: 12:00-14:00
Transportation

Airport to NUS

1. From the airport, take MRT Green Line towards the Joo Koon station. Alight at the Clementi station.

2. Take bus service no. 96 at Clementi Bus Interchange. Alight at Kent Ridge Crescent - NUS Raffles Hall. (bus stop number: 16169).

Hotel to Conference Venue

The FM organisation will provide free shuttle bus service between conference venue and this hotel. The timetable is listed as below:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 Nov, 2014</td>
<td>7:45am</td>
<td>Concorde Hotel to NUS COM2</td>
</tr>
<tr>
<td>19 Nov, 2014</td>
<td>6:15pm</td>
<td>NUS COM2 to Concorde Hotel</td>
</tr>
<tr>
<td>20 Nov, 2014</td>
<td>8:15am</td>
<td>Concorde Hotel to NUS COM2</td>
</tr>
<tr>
<td>20 Nov, 2014</td>
<td>3:50pm</td>
<td>NUS COM2 to Garden by the Bay (Walk)</td>
</tr>
<tr>
<td>20 Nov, 2014</td>
<td>6:30am</td>
<td>Garden by the Bay to MBS</td>
</tr>
<tr>
<td>20 Nov, 2014</td>
<td>9:45pm</td>
<td>MBS Coach Bay to Concorde Hotel</td>
</tr>
<tr>
<td>21 Nov, 2014</td>
<td>8:15am</td>
<td>Concorde Hotel to NUS COM2</td>
</tr>
<tr>
<td>21 Nov, 2014</td>
<td>2:15pm</td>
<td>NUS COM2 to Concorde Hotel</td>
</tr>
</tbody>
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Alternatively, you can

1. Take MRT at Somerset station (ID: NS23) and alight at Clementi station (ID: EW23).

2. Take bus service no. 96 at Clementi Bus Interchange. Alight at Kent Ridge Crescent, Computer Centre, NUS. (bus stop number: B16189).

Taxi Information

Taxi rides are cheap in Singapore and you can easily find one along the road. Alternatively, you can call a taxi with a $3 booking fee.

To come to the conference place, you can tell the taxi driver to go to NUS and then go to School of Computing, Building COM1.

You can call a taxi using the following numbers:

**Cab Comfort:** 65521111  
**Cab SMRT:** 65558888
Conference Venue Map

COM2 Level 4 Map

All conference venues are in COM2 Level 4.

Please go to Level 4 by the lift

Shuttle bus Pick up Point