ICECCS 2022 Program
(Time Zone: UTC+9, Tokyo Time)

March 26, 2022

8:00 – 10:00: Tutorial 1

Join Zoom Meeting
https://zoom.us/j/93040062433?pwd=VGpxN2J6V0R3alB3ejRucU4dU2dUZz09
Meeting ID: 930 4006 2433
Passcode: iceccs2022

Title: Reliability and availability of hardware-software systems

Lecturer: Professor Kishor Trivedi, Duke University, North Carolina, USA

Abstract: High reliability and availability are requirements for most technical systems including computer and communication systems. Reliability and availability assurance methods based on probabilistic models is the topic addressed in this talk. Non-state-space solution methods are often used to solve models based on reliability block diagrams, fault trees and reliability graphs. Relatively efficient algorithms are known to handle systems with hundreds of components and have been implemented in many software packages. Nevertheless, many practical problems cannot be handled by such algorithms. Bounding algorithms are then used in such cases as was done for a major subsystem of Boeing 787. Non-state-space methods derive their efficiency from the independence assumption that is often violated in practice. State space methods based on Markov chains, stochastic Petri nets, semi-Markov and Markov regenerative processes can be used to model various kinds of dependencies among system components. Linux Operating System and WebSphere Application server are used as examples of Markov models. IBM research cloud is used as an example of stochastic Petri net model. However, the state space explosion of such models severely restricts the size of the problem that can be solved. Hierarchical and fixed-point iterative methods provide a scalable alternative that combines the strengths of state space and non-state-space methods and have been extensively used to solve
real-life problems. Real-world examples of such multi-level models from IBM, Cisco and Sun Microsystems will be discussed. Hardware systems as well as software systems and their combinations will be addressed via these examples. Novel approaches to software fault tolerance will be discussed.

10:00 – 10:15: Break

10:15 – 12:15: **Tutorial 2**

Join Zoom Meeting
https://zoom.us/j/93040062433?pwd=VGpxN2J6V0R3alB3ejRueU14U2dUZz09
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**Title:** Software Quality Assurance as a Service (STAR): A revolutionary Approach

**Lecturer:** Dr. Kazu Okumoto, CEO, Sakura Software Solutions (3S) LLC

**Abstract:** In this tutorial we will introduce a real-time interactive cloud-based tool, STAR, which implements a revolutionary approach to zero-touch automation for defect prediction. It enables quick and easy decision making across the development cycle to ensure high quality software. Available in STAR, our dynamic tool allows you to see the real-time impact that multiple corrective actions have on software quality & delivery schedule. It really is the most straightforward representation of software quality assurance. It is now available for anybody anytime and anywhere. We will provide a live demonstration of STAR to highlight input data and several output views with state-of-the-art user interface and visualization techniques. From pioneering research in software systems reliability, data networking and reliable distributed computing, to creating fundamental breakthroughs in the understanding and automation of robust software delivery, we pushed the known limits of computing science and how to capitalize on these advances for practical technological innovations. We successfully integrated these innovations into software design for reliability as a best practice.
**March 27, 2022**

**Workshop DCCS 2022 Program**

Join Zoom Meeting  
https://zoom.us/j/99103129296?pwd=REZkM3ZCN3ZVTnZrY3JYbzITMXZqUT09  
Meeting ID: 991 0312 9296  
Passcode: dccs2022

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Details</th>
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| 08:50-09:00| **Opening**  
Xiao-Yi Zhang and Junjun Zheng (Program Chairs)                                                                                                 |
| 09:00-09:25| **Session 1:**  
**Session Chair:** Xiao-Yi Zhang (National Institute of Informatics, Japan)  
**Karnaugh-Veitch Maps as Minimal Formal Contract Between Textual Requirements and Tests**  
Nils Müllner (Institute of Transportation Systems, DLR, Germany)  
**Hierarchical Bayesian Parameter Estimation of Queueing Systems Using Utilization Data**  
Chen Li (Kyushu Institute of Technology, Japan), Junjun Zheng (Ritsumeikan University, Japan),  
Hiroyuki Okamura, and Tadashi Dohi (Hiroshima University, Japan)  
**Homotopy Class Informed Preprocessor for Configuration Space Reduction of Anytime Motion Planning**  
Yang Liu (Beihang University, China) and Fangyun Qin (Capital Normal University, China) |
| 09:25-09:50|  
| 09:50-10:10|  
| 10:10-10:20| **Break Time**                                                                                                                                       |
| 10:20-10:45| **Session 2:**  
**Session Chair:** Chen Li (Kyushu Institute of Technology, Japan)  
**Privacy Protection of Personal Education Information on Blockchain**  
Hongjing Deng (Yunnan University, China), Xuan Zhang (Key Laboratory of Software Engineering of Yunnan Province, China), Jiahao Jiang, Jie Wang, and Hexiang Huang (Yunnan University, China)  
**Variance-Based Sensitivity Analysis for Markov Models Using Moment Approximation**  
Jiahao Zhang (Hiroshima University, Japan), Junjun Zheng (Ritsumeikan University, Japan),  |
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<tr>
<th>Time</th>
<th>Session 3:</th>
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<tr>
<td>11:30-11:40</td>
<td>Break Time</td>
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<tr>
<td>11:40-12:05</td>
<td><strong>Automatic Source Code and Pseudocode Generation for Secure Connectors</strong></td>
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<td>Manisha Wakase, Michael Shin (Texas Tech University, USA), and Hassan Gomaa (George Mason University, USA)</td>
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<td>12:05-12:30</td>
<td><strong>Are Infinite-failure NHPP-based Software Reliability Models Useful?</strong></td>
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<td>Siqiao Li, Tadashi Dohi, and Hiroyuki Okamura (Hiroshima University, Japan)</td>
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<tr>
<td>12:30-12:50</td>
<td><strong>Monitoring the Status of CNN Models Through Their Spectra</strong></td>
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<td>Xiao-Yi Zhang (National Institute of Informatics, Japan)</td>
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<tr>
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<td><strong>Closing</strong></td>
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ICECCS 2022 Main Conference Program
March 28, 2022

Join Zoom Meeting
https://zoom.us/j/95436289772?pwd=TWc1MzBJVzIwREIzVtcHlzQkpjQT09
Meeting ID: 954 3628 9772
Passcode: iceccs2022

10:00 – 10:15: Opening

10:15 – 11:15: Keynote talk (Chair: Tadashi Dohi)
Software Fault Injection Testing
Jeffrey Voas
Video presentation link:
https://app.box.com/s/y11qeh1yl5u360fxy84fvrvolujudmor

11:15 – 11:30: Break

11:30 – 12:30: Session 1: Formal Semantics (Chair: Guangdong Bai)
Denotational and Algebraic Semantics for Cyber-physical Systems
Ran Li, Huibiao Zhu, Richard Banach
Video presentation link:
https://app.box.com/s/28kbv2jui5okj2e4r3hmj0jx0xn2r56j

The Operational and Denotational Semantics of rMECal Calculus for Mobile Edge Computing
Jiaqi Yin, Huibiao Zhu
Video presentation link:
https://app.box.com/s/sxmcvd3m5evdcx1yw5uiwlcaejc3lc5

12:30 – 14:00: Break

14:00 – 15:45: Session 2: Deep Learning (Chair: Jun Sun)
Generating Adversarial Source Programs using Important Tokens-based Structural Transformations
Penglong Chen, Zhen Li, Yu Wen, Lili Liu
Video presentation link:
DLGR: A Rule-Based Approach to Graph Replacement for Deep Learning
Enze Ma
Video presentation link: https://app.box.com/s/jzfkorkrbahyvfbi402c8b795j0m181t

Extending Tensor Virtual Machine to Support Deep-Learning Accelerators with Convolution Cores
Yanzhao Wang, Fei Xie
Video presentation link: https://app.box.com/s/zl85ckfd6c6ew8z2fr1xco8qx89ji9s6

Extension-Compression Learning: A Deep Learning Code Search Method That Simulates Reading Habits
Lian Gu, Zihui Wang, Jiaxin Liu, Yating Zhang, Dong Yang, Wei Dong
Video presentation link: https://app.box.com/s/oozjatb8taqsiponixzawj4ntc4hp1ne

15:45 – 17:00: Break

17:00 – 18:20: Session 3: System Security (Chair: Yamine Ait Ameur)
Minimal Schedule with Minimal Number of Agents in Attack-Defence Trees
Jaime Arias, Laure Petrucci, Łukasz Maško, Wojciech Penczek, Teofil Sidoruk
Video presentation link: https://app.box.com/s/kvfbyjr2egt4u7zsst5nqbe31hgbq5ap

Hos-ML: Socio-Technical System ADL Dedicated to Human Vulnerability Identification
Paul Perrotin, Nicolas Belloir, Salah Sadou, David Hairion, Antoine Beugnard
Video presentation link: https://app.box.com/s/0x6ddpuje3ogzamhmv956sxoo1dxgmiw

Reducing Malware labeling Efforts Through Efficient Prototype Selection
Guanhong Chen, Shuang Liu
Video presentation link:
https://app.box.com/s/c9llpec0vdoo6pxl3nbi12xwd9bmm20p

March 29, 2022

Join Zoom Meeting
https://zoom.us/j/95550922552?pwd=SkV6MG5UMTNJc0RLNjlyaHZtRzZPUT09
Meeting ID: 955 5092 2552
Passcode: iceccs2022

17:00 – 18:00: **Keynote talk (Chair: Shaoying Liu)**
Hierarchical Analysis and Verification for Critical System Design
Michael Butler

18:00 – 19:30: Break

19:30 – 20:30: **Session 4: System Performance (Chair: Yuting Chen)**
Optimizing Parallel Java Streams
Matteo Basso, Filippo Schiavio, Andrea Rosà, Walter Binder
Video presentation link:
https://app.box.com/s/w890oil4topw49o1dvy20rxm5sxkwoq8

Parameterized Design and Formal Verification of Multi-ported Memory
Mufan Xiang, Yongjian Li, Sijun Tan, Yongxin Zhao, Yiwei Chi
Video presentation link:
https://app.box.com/s/sabax762ft5c560gi4bi9ylmaym3hwwl

Self-adaptation in Microservice Architectures: A Case Study
Sree Ram Boyapati, Claudia Szabo
Video presentation link:
https://app.box.com/s/e9y4tvq2ptrdzepq34qmv3j3dufb5m8s

Multi-layer Event Analytic Method of Adaptive Software Orienting at Uncertain Environments
Xinyue Li, Wu Chen
Video presentation link: https://app.box.com/s/csd37iokznj787bkjridsiu4je65husj

March 30, 2022

Join Zoom Meeting for Keynote talk and Session 6:
https://zoom.us/j/91371612034?pwd=VnFLMTZjN0pXQXY2NIFINEgyZE1OUT09
Meeting ID: 913 7161 2034
Passcode: iceccs2022

9:00 – 10:00: **Keynote talk (Chair: Hiroyuki Okamura)**
From Safe and Reliable to Accountable Software and Systems
Bojan Cukic

10:00 – 10:15: Break

10:15 – 11:35: **Session 6: Verification and Testing (Chair: Fuyuki Ishikawa)**
A Bounded Semantics for Improving the Efficiency of Bounded Model Checking
Wenhui Zhang, Ya Gao
Video presentation link: https://app.box.com/s/71h50ayd3z5e956newhydrh81z83cukf6

(S)A Digital Twin Runtime Verification Framework for Protecting Satellites Systems from Cyber Attacks
Zhe Hou, Qinyi Li, Ernest Foo, Jin Song Dong, Paulo de Souza
Video presentation link: https://app.box.com/s/1prluak2hjx84knuneh06yr1fl69x7ek

(S)A Novel Intelligent-Building-Fire-Risk Classification Method
Weilin Wu, Na Wang, Yixiang Chen
Video presentation link: https://app.box.com/s/etd1kiw52nxfn2jtl82l5r9yteuu5qxz

11:35 – 16:00: Break
Join Zoom Meeting for Sessions 7 and 8:
https://zoom.us/j/96422970720?pwd=WS9FdXM0NWpRR3lDUDFlK00xVFEvZz09
Meeting ID: 964 2297 0720
Passcode: iceccs2022

16:00 – 18:25: **Session 7: Formal Methods (Chair: Fatiha Zaidi)**
A Formal Model for Fault Tolerant Parallel Matrix Factorization
Camille Coti, Laure Petrucci, Daniel Alberto Torres Gonzalez
Video presentation link:
https://app.box.com/s/m4t5808bozlm5srktvh2cgepvmyt6d7f

EB4EB: A Framework for Reflexive Event-B
Peter Riviere, Neeraj Singh, Yamine Ait Ameur
Video presentation link:
https://app.box.com/s/brqlnwgpudl08yrghm0yo8e0sfxexlb

Formalism-Driven Development of Decentralized Systems
Yepeng Ding, Hiroyuki Sato
Video presentation link:
https://app.box.com/s/8dgbne0y1h6ec6xypi4xq8cgpo8lhmd2

Distributed Explicit State Space Exploration with State Reconstruction for RDMA Networks
Sami Evangelista, Laure Petrucci, Lars Kristensen.
Video presentation link:
https://app.box.com/s/u6abhohkqd0qbt1z6y9rpyokku796yty

(S)Building Correct Hybrid Systems using EVENT-B and SAGEMATH:
Illustration by the Hybrid Smart Heating System Case Study
Meryem Afendi, Amel Mammar, Regine Laleau
Video presentation link:
https://app.box.com/s/ax1q8dfqi5g2c1k65a6bp32uuzztu86d9

19:55 – 21:20: **Session 8: Static Analysis** *(Chair: Jianjun Zhao)*

- Characterizing Java Streams in the Wild
  Eduardo Rosales, Andrea Rosà, Matteo Basso, Alex Villazón, Adriana Orellana, Ángel Zenteno, Jhon Rivero, Walter Binder
  Video presentation link: [https://app.box.com/s/5jb9pns6u3q9jn5jzn166s0hbjgw69j](https://app.box.com/s/5jb9pns6u3q9jn5jzn166s0hbjgw69j)

- Combining Global and Local Representations of Source Code for Method Naming
  Cong Zhou, Li Kuang
  Video presentation link: [https://app.box.com/s/dzpoilknern7s37xgc25iu8iaozst6w](https://app.box.com/s/dzpoilknern7s37xgc25iu8iaozst6w)

- (S)Parameter Sensitive Pointer Analysis for Java
  Yulin Bao, Chenyi Zhang, Xilong Zhuo, Yongliang Wang
  Video presentation link: [https://app.box.com/s/wvgktg9if87jdrehanbsk1y3dds0ipwh](https://app.box.com/s/wvgktg9if87jdrehanbsk1y3dds0ipwh)

21:20 – 21:25: Closing

**Notice:**

1. All the papers with the `(S)` mark are short papers.
2. 30 minutes for each regular paper (25 minutes for presentation + 5 minutes for questions).
3. 25 minutes for each short paper (20 minutes for presentation + 5 minutes for questions)