

# 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=VGpxN2J6V0R3alB3ejRueUI4U2dUZz09>

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=VGpxN2J6V0R3alB3ejRueUI4U2dUZz09>

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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=REZkM3ZCN3ZVTnZrY3JYbzlTMXZqUT09>

Meeting ID: 991 0312 9296

Passcode: dccs2022

08:50-09:00	<b>Opening</b> Xiao-Yi Zhang and Junjun Zheng (Program Chairs)
	<b>Session 1:</b> Session Chair: Xiao-Yi Zhang (National Institute of Informatics, Japan)
09:00-09:25 09:25-09:50 09:50-10:10	<b>Karnaugh-Veitch Maps as Minimal Formal Contract Between Textual Requirements and Tests</b> Nils Müllner (Institute of Transportation Systems, DLR, Germany) <b>Hierarchical Bayesian Parameter Estimation of Queueing Systems Using Utilization Data</b> Chen Li (Kyushu Institute of Technology, Japan), Junjun Zheng (Ritsumeikan University, Japan), Hiroyuki Okamura, and Tadashi Dohi (Hiroshima University, Japan) <b>Homotopy Class Informed Preprocessor for Configuration Space Reduction of Anytime Motion Planning</b> Yang Liu (Beihang University, China) and Fangyun Qin (Capital Normal University, China)
10:10-10:20	<b>Break Time</b>
	<b>Session 2:</b> Session Chair: Chen Li (Kyushu Institute of Technology, Japan)
10:20-10:45 10:45-11:10 11:10-11:30	<b>Privacy Protection of Personal Education Information on Blockchain</b> 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) <b>Variance-Based Sensitivity Analysis for Markov Models Using Moment Approximation</b> Jiahao Zhang (Hiroshima University, Japan), Junjun Zheng (Ritsumeikan University, Japan),

	<p>Hiroyuki Okamura, and Tadashi Dohi (Hiroshima University, Japan)</p> <p><b>A Vertical Resource Allocation Solution Based on Adaptive Control in Private Cloud</b></p> <p>Siqian Gong (Beijing Jiaotong University, China)</p>
11:30-11:40	<b>Break Time</b>
	<p><b>Session 3:</b></p> <p>Session Chair: Junjun Zheng (Ritsumeikan University, Japan)</p>
<p>11:40-12:05</p> <p>12:05-12:30</p> <p>12:30-12:50</p>	<p><b>Automatic Source Code and Pseudocode Generation for Secure Connectors</b></p> <p>Manisha Wakase, Michael Shin (Texas Tech University, USA), and Hassan Gomaa (George Mason University, USA)</p> <p><b>Are Infinite-failure NHPP-based Software Reliability Models Useful?</b></p> <p>Siqiao Li, Tadashi Dohi, and Hiroyuki Okamura (Hiroshima University, Japan)</p> <p><b>Monitoring the Status of CNN Models Through Their Spectra</b></p> <p>Xiao-Yi Zhang (National Institute of Informatics, Japan)</p>
	<b>Closing</b>

# ICECCS 2022 Main Conference Program

March 28, 2022

Join Zoom Meeting

<https://zoom.us/j/95436289772?pwd=TWc1MzBJVzIwRElCbzVtcHlzQkpjQT09>

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/sxmcvd3m5evdex1yw5uiwlcaeje3lcz5>

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:

<https://app.box.com/s/thkwdfnlo0lz5oooqdqfny7tq5ps2c83>

(S)DLGR: A Rule-Based Approach to Graph Replacement for Deep Learning

Enze Ma

Video presentation link:

<https://app.box.com/s/jzfkorkrbahyvfb402c8b795j0m181t>

(S)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>

(S)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 Ameer)**

Minimal Schedule with Minimal Number of Agents in Attack-Defence  
Trees

Jaime Arias, Laure Petrucci, Łukasz Maśko, Wojciech Penczek, Teofil  
Sidoruk

Video presentation link:

<https://app.box.com/s/kvfbyjr2egt4u7zsst5nqbe31hgbq5ap>

(S)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/0x6ddpuje3ogzamhmv956sxo01dxgmiw>

(S)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>

20:30 – 21:30: **Session 5: Self-Adaptive Systems (Chair: Weikai Miao)**

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=VnFLMTZjN0pXQXY2NlFhNEgyZE1OUT09>

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/71h50ayd3z5e956newhyrh81z83cukf6>

(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/1prluak2hvx84knuneh06yr1fl69x7ek>

(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=WS9FdXM0NWpRR3IDUDFIK00xVFEvZz09>

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/brqlnwgpubl08yrghm0yo8e0sfexlbt>

Formalism-Driven Development of Decentralized Systems

Yepeng Ding, Hiroyuki Sato

Video presentation link:

<https://app.box.com/s/8dgbne0y1h6ec6xyipi4xq8cgpo8lhmd2>

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 Mammam, Regine Laleau

Video presentation link:

<https://app.box.com/s/ax1q8dfqi5g2c1k65a6bp32uuztu86d9>

18:25 – 19:55: Break

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/5jb9pns6u3q9jn5jzn166s0hbjgwc69j>

Combining Global and Local Representations of Source Code for Method Naming

Cong Zhou, Li Kuang

Video presentation link:

<https://app.box.com/s/dzpoilknern7s37xgc25iu8iaoazst6w>

(S)Parameter Sensitive Pointer Analysis for Java

Yulin Bao, Chenyi Zhang, Xilong Zhuo, Yongliang Wang

Video presentation link:

<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)