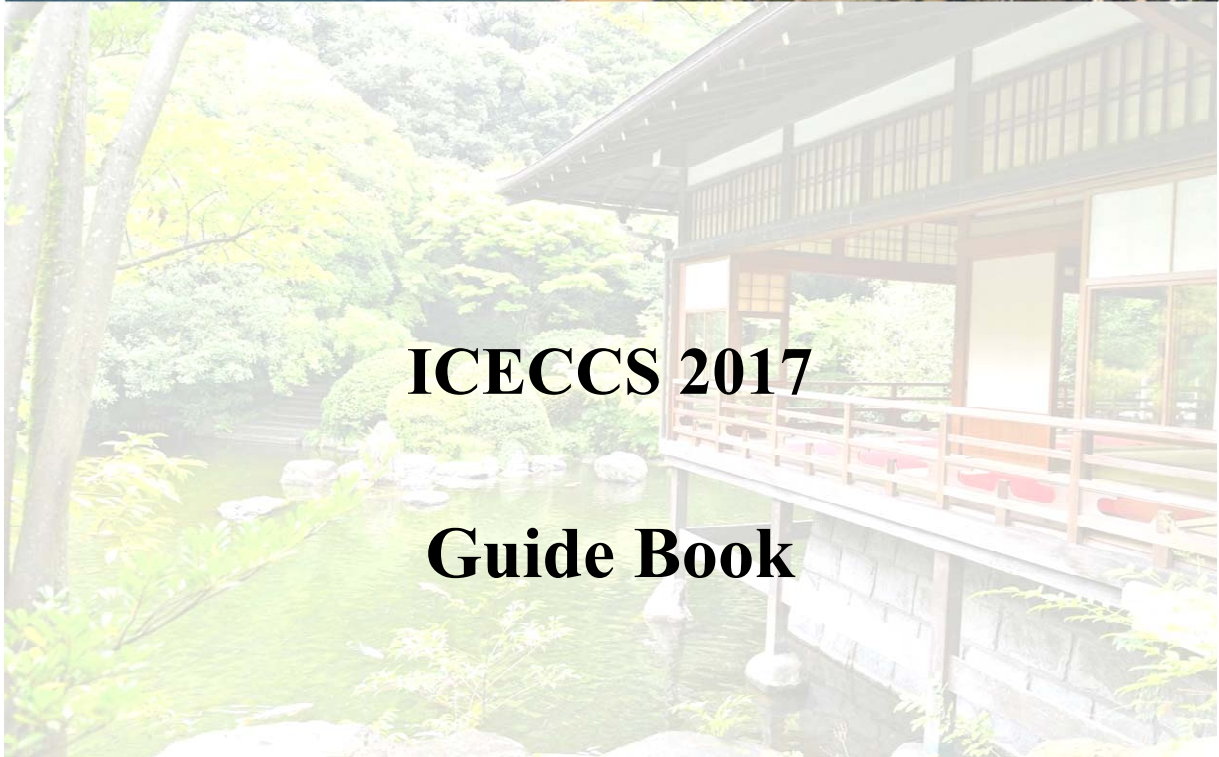




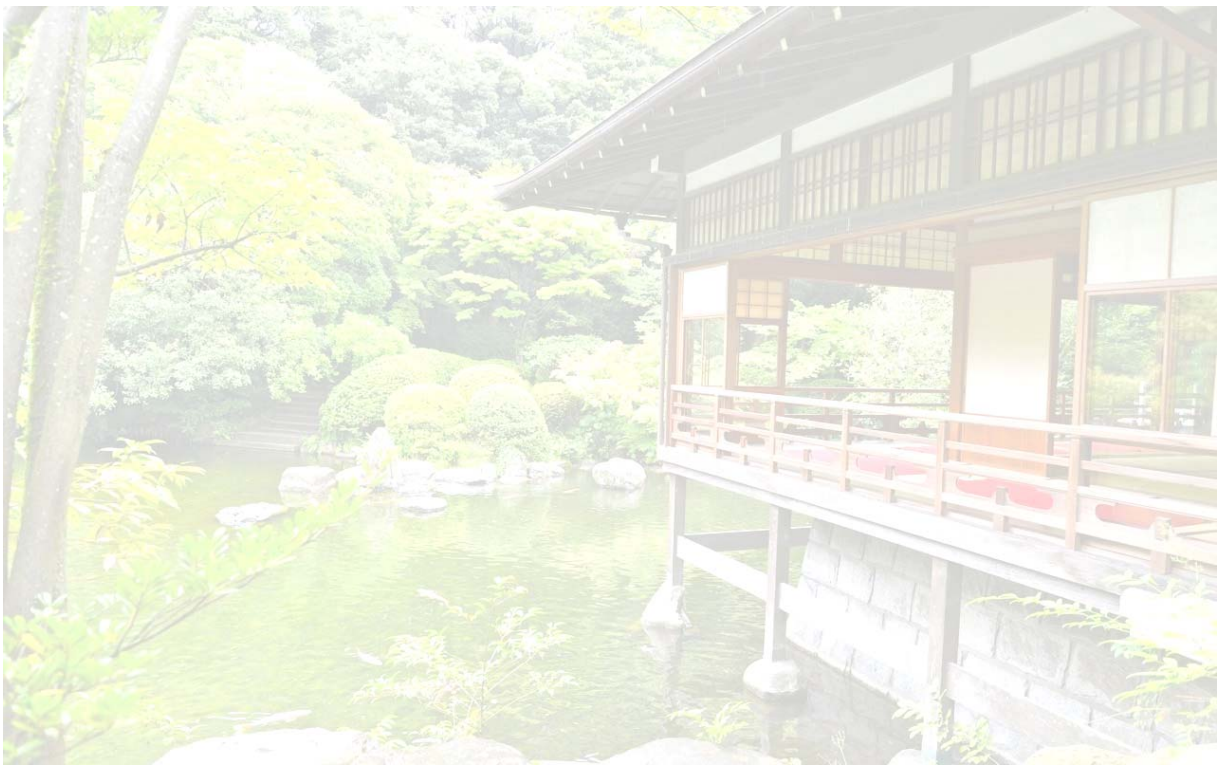
22nd International Conference on Engineering of Complex Computer Systems
November 6-8, 2017, Fukuoka, Japan



ICECCS 2017

Guide Book

November 6-8, 2017
Fukuoka, Japan



Greetings from the General and Program Chairs

Welcome you to the 22nd International Conference on Engineering of Complex Computer Systems (ICECCS 2017), held in the Kyushu University, November 6-8, 2017, Fukuoka, Japan.

Complex computer systems are common in many sectors, such as manufacturing, communications, defense, transportation, aerospace, hazardous environments, energy, and health care. These systems are frequently distributed over heterogeneous networks, and are driven by many diverse requirements on performance, real-time behavior, fault tolerance, security, adaptability, development time and cost, long life concerns, and other areas. Such requirements frequently conflict, and their satisfaction therefore requires managing the trade-off among them during system development and throughout the entire system life.

This year's conference has a strong technical program. In addition to three keynote addresses by David Basin from ETH Zurich, Katsuro Inoue from Osaka University, and Yang Liu from Nanyang Technological University, it also includes a selection of rigorously refereed papers presented in the regular paper and short paper sessions. The Program Committee has received 60 submissions and each paper was reviewed by at least three referees. We chose 14 full papers and 10 short papers as the result of intensive discussions held among the PC members.

We thank the authors for sharing their ideas with us, the reviewers for providing valuable and timely feedback, and all the PC members for taking time from their busy schedules to support this conference. The ICECCS steering committee was its usual helpful, in particular, we benefited a lot from invaluable advices from Jin Song Dong. The success of ICECCS is largely due to the hard work of our organizing committee. We would like to thank Yaokai Feng and Haibo Yu for serving as local arrangement co-chairs, Walter Binder and Jifeng Xuan for serving as workshop co-chairs, Naoyasu Ubayashi and Lei Ma for serving as publicity co-chairs, and Yun Lin for serving as publication chair.

We wish you to enjoy the program and have a great stay in Kyushu!

November 2017

Jianjun Zhao, ICECCS 2017 General Co-Chair
Baowen Xu, ICECCS 2017 General Co-Chair
Zhenjiang Hu, ICECCS 2017 Program Co-Chair
Guangdong Bai, ICECCS 2017 Program Co-Chair

Committees

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National Institute of Informatics, Japan
Guangdong Bai,
Singapore Institute of Technology,
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University, Singapore

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China

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Zealand



◆ Keynote Speakers

Verified Secure Routing: The Verified Scion Project

David Basin (ETH Zurich, Switzerland)

Abstract

Routing is at the heart of the Internet and has been a continual source of security problems since its expansion in the 1980s. SCION is a new approach to the Internet, which offers dramatically better security properties than we currently have. We describe a collaborative effort, the Verified Scion Project, at ETH Zurich that aims to verify Scion, going the full distance from high-level network-wide properties down to the code running on SCION routers. We will explain the issues involved, the approach we take, the progress we have made, and perspectives for the future.



The work reported on is joint work between three groups at ETH Zurich: my Information Security Group, the Network Security Group of Adrian Perrig, and the Programming Methodology Group of Peter Mueller.

Biography

David Basin is a full professor within the Department of Computer Science, ETH since 2003, where he heads the Information Security Group. He received his bachelor's degree in mathematics from Reed College in 1984, his Ph.D. from Cornell University in 1989, and his Habilitation from the University of Saarbrücken in 1996. His appointments include a postdoctoral research position at the University of Edinburgh (1990 - 1991), and afterwards he led a subgroup, within the programming logics research group, at the Max-Planck-Institut für Informatik (1992 - 1997). From 1997 - 2002 he was a full professor at the University of Freiburg where he held the chair for software engineering.

His research focuses on Information Security, in particular on foundations, methods, and tools for modeling, building, and validating secure and reliable systems. He is Editor-in-Chief of the ACM Transactions on Privacy and Security and of Springer-Verlag's book series on Information Security and Cryptography. He is also the founding director of ZISC, the Zurich Information Security Center, which he led from 2003-2011.

Exploring Similar Code

– From Code Clone Detection to Provenance Identification

Katsuro Inoue (Osaka University, Japan)

Abstract

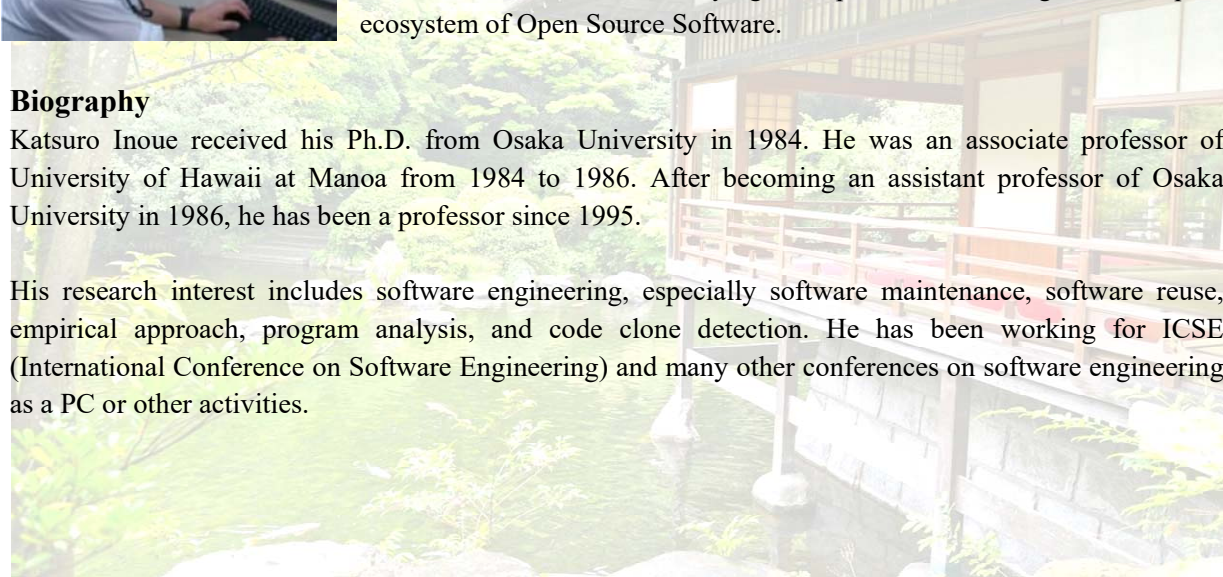
Code clone analysis is an activity to find similar code snippets in source code. Nowadays it becomes one of popular analyses characterizing redundancy and maintainability of source code. It has been studied for more than 20 years, and it is still a very active and attractive research field in Software Engineering. In this talk, we will present history and evolution of our research activities on code clone and related areas. Starting from an industry request for code maintenance, we have developed various tools and applied them to various fields. We will show also our current and future direction toward identifying code provenance in huge and complex ecosystem of Open Source Software.



Biography

Katsuro Inoue received his Ph.D. from Osaka University in 1984. He was an associate professor of University of Hawaii at Manoa from 1984 to 1986. After becoming an assistant professor of Osaka University in 1986, he has been a professor since 1995.


His research interest includes software engineering, especially software maintenance, software reuse, empirical approach, program analysis, and code clone detection. He has been working for ICSE (International Conference on Software Engineering) and many other conferences on software engineering as a PC or other activities.



Cyber-security, The Journey from Formal Methods, Program Analysis to Data Analytics

Yang Liu (Nanyang Technological University, Singapore)

Abstract



Cyber-security is a complex system research, which requires the knowledge across all layers of the computer architecture. In this talk, I would like to share our attempts to solve security problems using various techniques. Starting from formal methods, we have applied formal modeling and reasoning to security designs and implementations on the topics related to security protocols, virtualization systems and Android apps. These efforts lead to our recent research project "Security: A Compositional Approach of Building Security Verified System", which aims at building secure and verifiable systems ground-up. Security verification and building attack-free systems are very challenging tasks in the view of the size and the complexity of the systems. To solve the scalability problem, we start to explore various program analysis techniques to enhance the state-of-the-art malware and vulnerability detection, which generates encouraging results in JavaScript/Android malware and binary vulnerabilities hunting. Along the way, we have collected sizable malware/vulnerabilities samples, which are further used to improving security analysis, understand the security trend, attack attribution/correlation and eventually provide high-level intelligence.

Biography

Liu Yang graduated in 2005 with a Bachelor of Computing (Honours) in the National University of Singapore (NUS). In 2010, he obtained his PhD and started his postdoctoral work in NUS, MIT and SUTD. In 2011, Dr. Liu is awarded the Temasek Research Fellowship at NUS to be the Principal Investigator in the area of Cyber Security. In 2012 fall, he joined Nanyang Technological University as a Nanyang Assistant professor. He is currently the director of the cybersecurity lab in NTU.


He specializes in software verification, security and software engineering. His research has bridged the gap between the theory and practical usage of formal methods and program analysis to evaluate the design and implementation of software for high assurance and security. His work led to the development of a state-of-the-art model checker, Process Analysis Toolkit (PAT). This tool is used by research institutions in over 80 countries for research and education. By now, he has more than 150 publications in top tier conferences and journals and is leading an active research team working on various cybersecurity problems.

◆ Program

November 6th (Monday)	
Morning	
8:45	Registration
9:20 - 9:30	Opening
9:30 - 10:30	Keynote I (Chair: Zhenjiang Hu)
	Verified Secure Routing: The Verified Scion Project David Basin (ETH Zurich, Switzerland)
10:30 - 11:00	Coffee Break
11:00 - 12:20	Session 1: Formal Method I (Chair: Jianjun Zhao)
	Efficient Parameter Synthesis Using Optimized State Exploration Strategies Hoang Gia Nguyen, Étienne André and Laure Petrucci
	Integrating Tools: Co-Simulation in UPPAAL using FMI-FMU Peter Gjøøl Jensen, Kim Guldstrand Larsen, Axel Legay and Ulrik Nyman
	Towards Solving Decision Making Problems Using Probabilistic Model Checking (Short) Ling Shi, Shuang Liu, Jianye Hao, Jun Yang Koh, Zhe Hou and Jin Song Dong
12:20 - 14:00	Lunch
Afternoon	
13:50 - 15:20	Session 2: Formal Methods II (Chair: Naoyasu Ubayashi)
	Extending ERS for Modelling Dynamic Workflows in Event-B Dana Dghaym, Michael Butler and Asieh Salehi Fathabadi
	TLSsem: A TLS Security-Enhanced Mechanism against MITM Attacks in Public WiFi Wei Yang, Xiaohong Li, Zhiyong Feng and Jianye Hao
	Reachability Analysis of Self Modifying Code Tayssir Touili and Xin Ye Xinxin Li, Rui Wang and Yu Jiang

15:20 - 15:50	Coffee Break
15:50 - 17:20	Session 3: IoT/CPS (Chair: Jing Xu)
	Distributed Object-Oriented Design of Autonomous Control Systems for Connected Vehicle Platoons Sebti Mouelhi, Daniela Cancila and Amar Ramdane-Cherif
	BigrTiMo-A Process Algebra for Structure-aware Mobile Systems Wanling Xie and Huibiao Zhu
	Study of Software-Related Causes in the FDA Medical Device Recalls Zhicheng Fu, Chunhui Guo, Zhenyu Zhang, Yu Jiang, Lui Sha and Shangping Ren
18:00 - 20:00	Reception (on the first floor of the conference building)
November 7th (Tuesday)	
Morning	
9:00	Registration
9:30 - 10:30	Keynote II (Chair: Jianjun Zhao)
	Exploring Similar Code - From Code Clone Detection to Provenance Identification Katsuro Inoue (Osaka University, Japan)
10:30 - 11:00	Coffee Break
11:00 - 12:30	Session 4: Knowledge and Software Engineering (Chair: Xiaohong Li)
	Learning Likely Invariants to Explain Why a Program Fails Long H. Pham, Jun Sun, Ly Ly Tran Thi, Jingyi Wang and Xin Peng
	Search-based Uncertainty-wise Requirements Prioritization Yan Li, Man Zhang, Tao Yue, Shaukat Ali and Li Zhang
	Enhancing Knowledge Sharing in Stack Overflow via Automatic External Web Resources Linking Sa Gao, Zhenchang Xing, Yukun Ma, Deheng Ye and Shang-Wei Lin
12:30 - 14:00	Lunch

Afternoon	
14:00 - 15:20	Session 5: Design and Analysis I (Chair: Lei Ma)
	A Composition Mechanism for Refinement-Based Methods Thai Son Hoang, Dana Dghaym, Colin Snook and Michael Butler
	Class Modularization Using Indirect Relationships Junha Lee, Dae-Kyoo Kim and Sooyong Park
	Model Driven Method to Design and Analyze Secure Architectures of Systems-of-Systems (Short) Jamal El Hachem, Tarek Al Khalil, Vanea Chiprianov, Ali Babar and Philippe Aniorte
15:20 - 15:50	Coffee Break
15:50 - 17:20	Session 6: Design and Analysis II (Chair: Walter Binder)
	Formal Modeling and Automatic Code Synthesis for Robot System (Short)
	A Unified Framework for Throughput Analysis of Streaming Applications under Memory Constraints Xue-Yang Zhu
	Evaluating Suitability of Applying Blockchain (Short) Sin Kuang Lo, Xiwei Xu, Yin Kia Chiam and Qinghua Lu
	Speeding up Type-specific Instrumentation for the Analysis of Complex Systems (Short) Andrea Rosà and Walter Binder
18:00 - 21:00	Banquet (in San Shiro Restaurant)
November 8th (Wednesday)	
Morning	
9:00	Registration
9:30 - 10:30	Keynote III (Chair: Baowen Xu)
	Cyber-security, The Journey from Formal Methods, Program Analysis to Data Analytics Yang Liu (Nanyang Technological University, Singapore)
10:30 - 10:50	Coffee Break

10:50 - 12:10	Session 7: Other Short Papers (Chairs: Haibo Yu and Zhe Hou)
	Multi-modeling approach to performance engineering of Cyber-Physical Systems design (Short) Lorenzo Pagliari, Raffaella Mirandola and Catia Trubiani
	Software Reliability Modeling and Analysis via Kernel-based Approach (Short) Kei Okumura, Hiroyuki Okamura and Tadashi Dohi
	Decomposition and Collaboration of Industrial Control System with Resource Constraints (Short) Ju Li, Jiawen Xiong, Xia Mao, Jianqi Shi, Xin Ye and Yanhong Huang
	Functional Requirements-Based Automated Testing for Avionics (Short) Youcheng Sun, Martin Brain, Daniel Kroening, Andrew Hawthorn, Thomas Wilson, Florian Schanda, Francisco Javier Guzmán Jiménez, Simon Daniel, Chris Bryan and Ian Broster
12:10 - 12:20	Closing
12:20 - 13:20	Lunch



◆ Conference Venue in Map

Nishijin Plaza, Kyushu University,

2-16-23 Nishijin, Sawara, Fukuoka, Fukuoka, 814-0002. Japan Fukuoka, Japan

About 5 minutes on foot from the subway station Nishijin, Exit No.7.



Momochi

GOURMET MAP

- ① TNC (TV station)
1F
 - ・まさ庄【Masasho】(sushi)
 - ・大明担担麵【Daimeitantanmen】(chinese noodle)
 - ・アバシカレー【Abashi Curry】(Indian food)
 - ・La Manina (italian restaurant)
 - ・月とうさぎ【Tsuki-to-usagi】(japanese restaurant)
 - ・McDonald (fast food)
 - ・Subway (fast food)
 - ・TULLY'S COFFEE
- 3F
 - ・とめ手羽【Tometeba】(Restaurant)
- ② RKB (TV station) 1F
 - ・ハロー【Hello】(restaurant)
- ③ Fukuoka tower 1F
 - ・煉瓦倶楽部【Rengakurabu】(restaurant)
- 4F
 - ・ルフージュ【Refuge】(sky Lounge restaurant)
- ④ Marizon (bridal, shop & restaurant)
 - ・MAMMA MIA (italian restaurant)
 - ・THE BEACH (café & restaurant)
 - ・ひなた食堂【Hinata-shokudo】(restaurant)



- ⑤ 福岡山王病院 (Fukuoka Sanno hospital) 5F
 - ・Aube (restaurant)
- ⑥ 福岡市総合図書館 (Fukuoka city public library) 1F
 - ・Marques (lunch)
- ⑦ 福岡市美術館 (Fukuoka city museum) 2F
 - ・喫茶室【Kissashitsu】(restaurant)
 - ・梅の花【Ume-no-hana】(traditional japanese-style restaurant)
- ⑧ The residential suites Fukuoka (hotel) 1F
 - ・LEPICIER VINGET ET UN (restaurant)
- ⑩ 1F
 - ・浜勝【Hamakatsu】(pork cutlets)
- 2F
 - ・益正【Masumasa】(seafoods)
- ⑪ M-Tower (office) 2F
 - ・La Brioche Caffé (italian restaurant)
- ⑫ TWINS MOMOCHI (hotel) 1F
 - ・飲中八仙歌【Inchuhassenka】(drink & lunch)
- ⑬ SRP center building 1F
 - ・コマダ珈琲店【Komeda coffee shop】(café)
- ⑭ Hilton hotel 4F, 5F, 6F, 35F
 - various restaurants
 - Lunch box selling area
- ⑮ Convenience store

Conf. Venue

◆ Reception

- Place: 1F of the conference venue
- Time: 18:00~20:00 (November 6th, 2017)

◆ Banquet

- Place: Restaurant “San Shi Rou” 三四郎
- Address: 3-1-6, Atago, Nishi-ku, Fukuoka
- Distance: About 10 minutes from the conference venue by taxi
- Time : 18:00 - 21:00 (November 7th, 2017)

★Several taxies will be waiting at the conference venue at about 17:30.

