ICST 2017, ICSTW 2017, & IWESEP 2017

13-17 March 2017
Waseda University,
Tokyo, Japan

ICST

IWESEP 2017

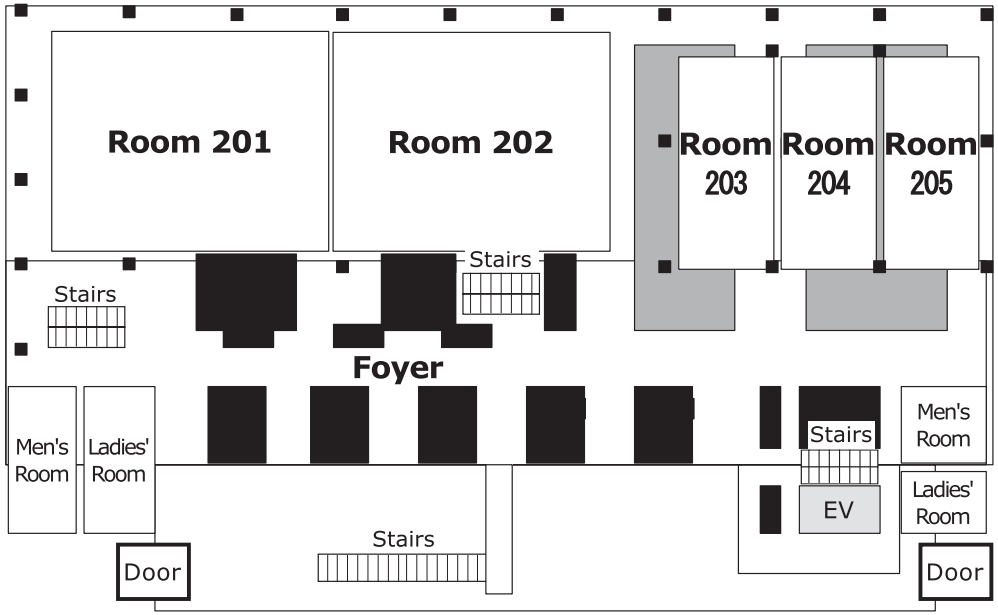
10th IEEE International Conference on Software Testing, Verification and Validation (ICST 2017)

10th IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW 2017)

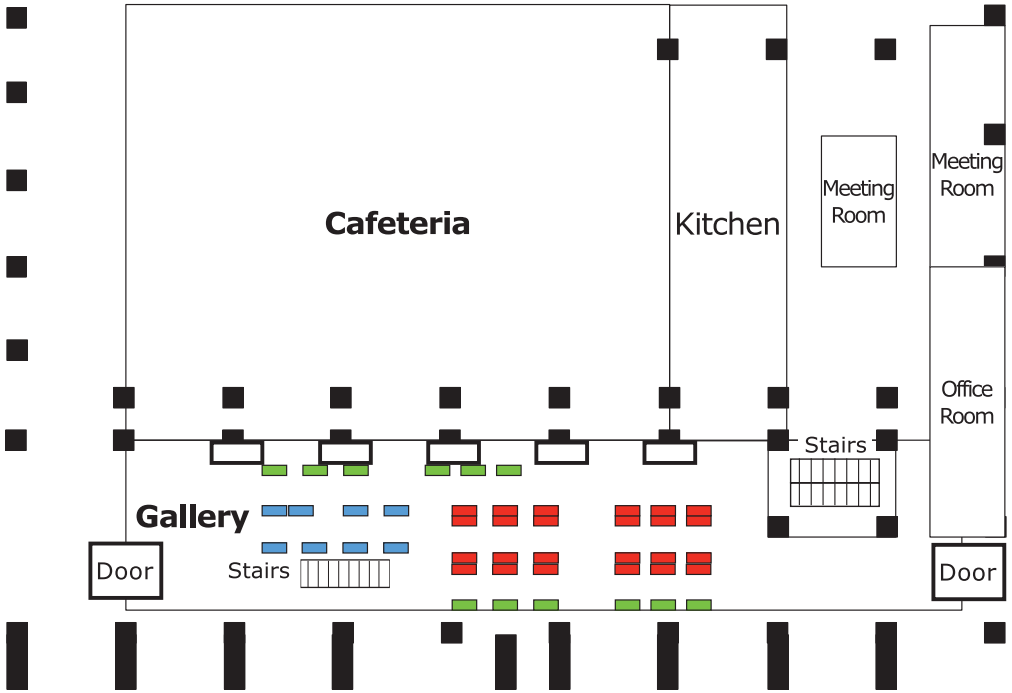
8th IEEE International Workshop on Empirical Software Engineering in Practice (IWESEP 2017)

Conference Venue - Bldg. 63, Nishi-Waseda Campus, Waseda Univ.

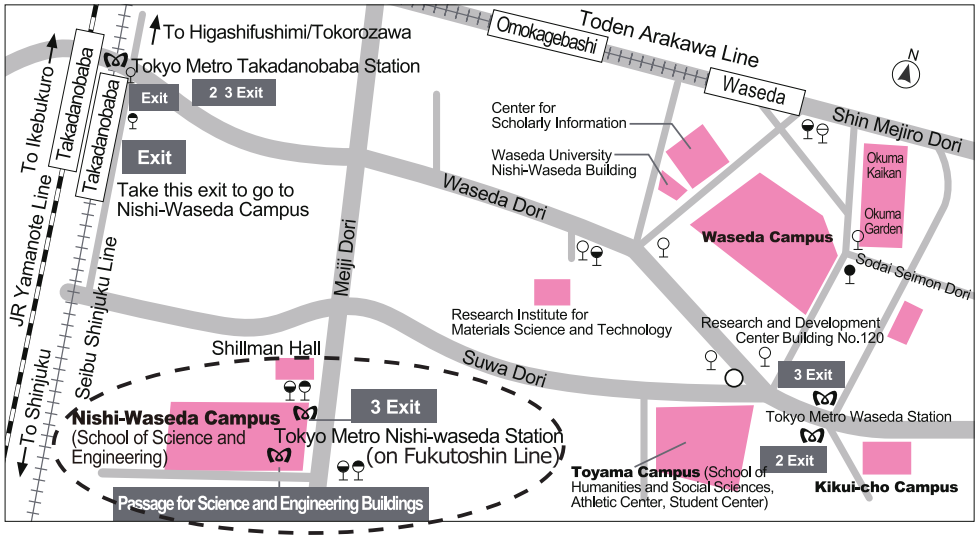
2nd Floor



Ground Floor

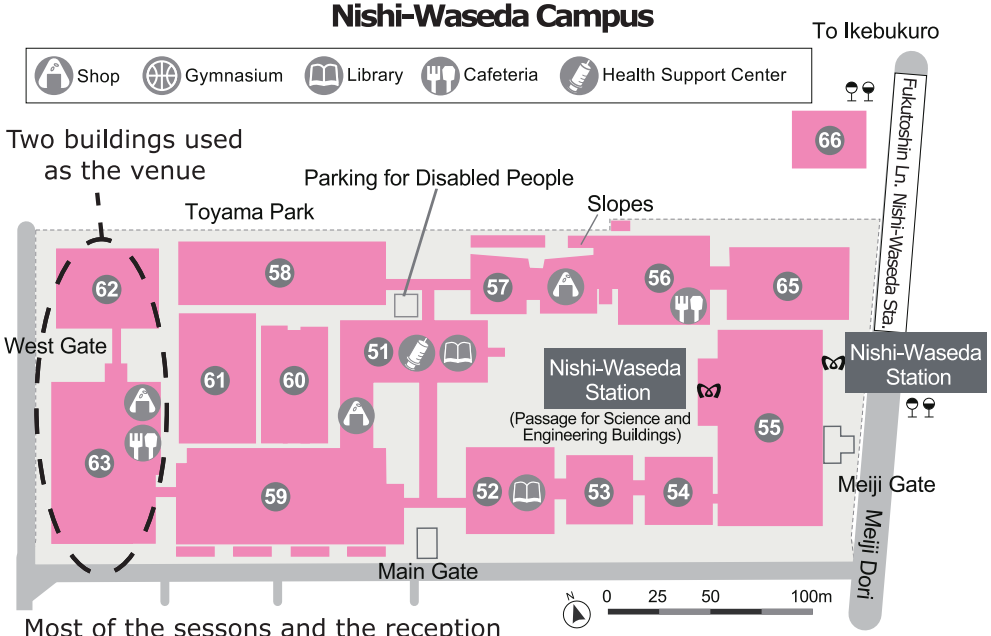


Access to Nishi-Waseda Campus



From Nishi-Waseda station use "3 Exit" near Shibuya side of the platform, and you will be taken directly to Nishi-Waseda campus where two buildings used as the conference venue are located.

Nishi-Waseda Campus



Most of the sessons and the reception on Tuesday take place in **Building 63**, while some workshops on Monday are assigned rooms in **Building 62**.

10th IEEE International Conference on Software Testing, Verification and Validation

10th IEEE International Conference on Software Testing, Verification and Validation Workshops

13-17 March 2017
Waseda University, Tokyo, Japan

Conference Program

Message from the ICST 2017 General Chairs

Yokoso! We welcome you all to Tokyo, Japan, for the 10th IEEE International Conference on Software Testing, Verification and Validation (ICST 2017). Yes, ICST is 10 years old! It seems like only yesterday that the founders of this conference were talking about establishing ICST, emphasizing the importance of having a flagship all-encompassing annual event for the software testing and verification community. Over the years, ICST has indeed become the go-to event for our field.

We are excited that ICST 2017 is being held in Japan, a country known for its innovation and practical application of quality improvement processes. Beautiful and impressive Tokyo, the capital of Japan is the focal point of much of Japan's financial and industrial activity. Holding the conference in Tokyo has ensured the participation and support of major companies and professional organizations. Tokyo also boasts of facilities important for a successful conference. It has been ranked first in the "Best overall experience" category of TripAdvisor's World City Survey. The city also ranked first in the categories: Helpfulness of locals, Nightlife, Shopping, Local public transportation and Cleanliness of streets. The Michelin Guide has awarded Tokyo by far the most Michelin stars of any city in the world. Tokyo also has plenty of cultural and exciting places such as museums, the sumo wrestling arena, the kabuki theater, and Akihabara town.

Our aim is to have this meeting continue the long ICST tradition of fostering the integration of software testing and verification research and practice, which is why we have worked very hard to develop a strong technical content that combines research, practice, and tools. For this, our deep thanks go to Ina Schieferdecker and Hironori Washizaki, Chairs of the Main Technical Track Program Committee for putting together an amazing technical program. In addition, we also wish to thank Bao Nguyen and Xun Yuan for Chairing the Industry Papers Track and encouraging practitioners to showcase their work on the application of recently developed techniques to real industrial software systems. We thank Domenico Amalfitano and Tatsuhiro Tsuchiya, Chairs of the Testing Tools Papers Track, for putting together an excellent set of papers that describe new tools for software testing and verification. We thank Zhenyu Chen and Ana Paiva, Tool Demonstrations Chairs, for all their hard work both before and during the conference so that we can get first hand experience with new tools. We thank Aho Pekka, Posters Chair, for single-handedly putting together an amazing set of posters for us to enjoy during the conference and coffee breaks. Finally, we thank Kinji Akemine, Emil Alégroth, Shinsuke Matsuki, and Tanja E. J. Vos, for organizing the International Software Testing Contest, in which new techniques can compete to detect the maximum number of bugs.

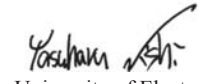
On the organizational front, we are deeply indebted and grateful to Myra Cohen and Wei Le, our Workshops Chairs, who managed and organized all the workshops associated with ICST; Anna Rita Fasolino and Jeff Offutt, for running the Doctoral Symposium, a valuable event for our PhD students; Sreedevi Sampath and Tetsuro Katayama, our Finance Chairs who had to balance our budgets and deal with IEEE rules; Renee Bryce and Zebao Gao, our Awards Chairs for creating our awards plaques and certificates; Shingo Takada, our Student Volunteers Chair for organizing and taking care of our student volunteers; Leslie C Milton, our Diversity Chair, for ensuring that diversity was considered at all points in the conference; Susumu Tokumoto, our Registration Chair for putting together a wonderful registration system; Hideo Tanida and Tomohiko Takagi, our Proceedings Chairs for ensuring that these proceedings make it to you on time; Toshiaki Aoki, our Publicity Chair, for spreading the word about this event; Shuji Morisaki, our Tutorials Chair, for organizing this year's tutorials; and Masato Matsuoka, Michael Mlynarski, Andrej Pietschker, Adam Porter, and Shlomo Mark, our Marketing Chairs, for reaching out to sponsors; Saiji Nema, our Web Chair, for putting together our website and keeping it updated; Keizo Tatsumi, our Social Networking Chair for managing our social networking; and Satomi Yoshizawa and Chio Fujimoto, our Local Arrangements Chairs for their extreme patience and help with this conference.

We are especially excited about our two panel discussions, the first of which bring together practitioners from Industry to discuss their current software testing practices, and the challenges they face. Our second panel discusses issues of software quality in our Computer Science and Engineering University curricula, and efforts to design a quality-driven curriculum.

It takes a diverse and hard-working team to put a conference together. Working with this team has been an amazing experience for us. Working together, we hope that we have created an event that is long remembered by the community, both enjoyable and educational. Once again, we welcome you to ICST 2017.

General Chairs of ICST 2017

Atif Memon
University of Maryland, USA
atif@cs.umd.edu



Yasuharu Nishi
University of Electro-Communications
Tokyo, Japan
Yasuharu.Nishi@uec.ac.jp

Message from the ICST 2017 Program Chairs

It is our great pleasure to welcome you to Waseda University, Tokyo, Japan, for ICST 2017, the 10th IEEE International Conference on Software Testing, Verification and Validation!

ICST continues to be the premier conference on software quality. Along with the increasing importance of software in all types of cyberphysical systems (e.g., safety-critical, security-critical, mission-critical or autonomous systems), both the demands and challenges of software quality engineering have continued to grow. In its 10th anniversary, ICST celebrates recent excellent results in software testing, verification and validation. It brings together researchers and practitioners who work on theoretical foundations, methods, algorithms, technologies, tools and applications in software testing, verification and validation.

ICST is the top forum for presentations and discussions on all aspects of software testing, verification and validation. The conference program includes 3 keynotes by John Micco, Google, USA; Kenji Nishikawa, Toyota Motor Corporation, Japan; and Andreas Zeller, Saarland University, Germany. In the main research program, 36 full papers and 8 short papers out of 135 paper submissions are presented in 14 sessions. The selected papers cover a variety of topics including faults, theory and complexities, security testing, model-based testing, parallel systems and concurrency, web and mobile applications, regression testing, automated and run-time testing, empirics on testing, search-based testing, and model checking and verification. The industrial track attracted 18 submissions of which 6 were accepted. Moreover, the testing tools papers track attracted 29 submissions of which 10 were accepted. They will be presented in sessions on 14–16 March 2017. The submissions altogether demonstrate the strong ongoing interest in the field.

Furthermore, ICST presents 7 workshops including Mutation (12th International Workshop on Mutation Analysis), TAIC PART (12th Workshop on Testing: Academia-Industry Collaboration, Practice and Research Techniques), ITEQS (1st International Workshop on Testing Extra-Functional Properties and Quality Characteristics of Software Systems), IWCT (6th International Workshop on Combinatorial Testing), A-MOST (13th Workshop on Advances in Model-Based Testing), InSTA (4th International Workshop on Software Test Architecture), and ACSE (First Asian Symposium on Collaborative Software Engineering). The doctoral symposium includes 7 presentations by PhD students. The 3 co-located events, IWESEP (8th IEEE International Workshop on Empirical Software Engineering in Practice), AsianPLoP (6th Asian Conference on Pattern Languages of Programs), and IPSJ/SIGSE (195th meeting of Special Interest Group on Software Engineering, Information Processing Society of Japan), together with the special session on Aerospace IV&V, the poster session, tool demonstrations, panels, and the testing contest complete the program.

We would like to extend our most heartfelt thanks to all the authors of all the submitted papers and proposed workshops, who are working hard to advance our field, to improve software quality, and to share their advancements at ICST. Special thanks go to the 73 program members and external reviewers who each did up to 10 detailed, well-argued reviews and meta-reviews in a timely manner and contributed to the discussion in the selection process. We thank the authors and the keynote speakers, who provide the content of our program and are presenting their contributions at the conference. Last but not least, the ICST steering committee always had good recommendations and provided help whenever it was need. Thank you!

You all greatly helped us in selecting and shaping this great program for ICST 2017. We hope that you will find the program interesting and inspiring for your upcoming work and research.

Finally, we look forward to meeting and having discussions with presenters and participants. Please all take the opportunity to exchange results, to share visions and ideas, to learn from each other, and to meet new colleagues and potential collaborators in our young and vibrant software testing, verification, and validation community.

Please enjoy the conference program!

Program Chairs of ICST 2017

Ina Schieferdecker
Fraunhofer FOKUS / TU Berlin
Germany

Hironori Washizaki
Waseda University
/ National Institute of Informatics
/ SYSTEM INFORMATION
Japan

ICST 2017 Organization

Organizing Committee

General Chairs
Atif Memon, University of Maryland, USA
Yasuharu Nishi, University of Electro-Communications Tokyo, Japan

Program Chairs
Ina Schieferdecker, Fraunhofer, Fraunhofer FOKUS, Germany
Hironori Washizaki, Waseda University, Japan

Workshops Chairs
Myra Cohen, University of Nebraska - Lincoln, USA
Wei Le, Iowa State University, USA

Doctoral Symposium Chairs
Anna Rita Fasolino, Università degli Studi di Napoli Federico II,Italy
Jeff Offutt, George Mason University, USA

Industry Track Chairs
Bao N. Nguyen, Google, USA
Xun Yuan, Google, USA

Testing Tools Track Chairs
Domenico Amalfitano, Università degli Studi di Napoli Federico II, Italy
Tatsuhiro Tsuchiya, Osaka University, Japan

Demonstrations Chairs
Zhenyu Chen, Software Institute, Nanjing University, Nanjing, China
Ana Paiva, University of Porto, Portugal

Posters Chair
Pekka Aho, VTT Technical Research of Finland, Finland

International Software Testing Contest Chairs
Emil Alégroth, Blekinge Institute of Technology, Sweden
Tanja E. J. Vos, Open University in The Netherlands, Netherlands
Kinji Akemine, NTT DATA Corporation, Japan
Shinsuke Matsuki, VeriServe Corporation, Japan

Finance Chairs
Sreedevi Sampath, University of Maryland Baltimore County (UMBC), USA
Tetsuro Katayama, University of Miyazaki, Japan

Awards Chairs
Renee Bryce, University of North Texas, USA
Zebao Gao, Department of Computer Science, University of Maryland, USA

Student Volunteers Chair
Shingo Takada, Keio University, Japan

Diversity Chair
Leslie C. Milton, U.S. Army Engineer Research and Development Center, USA

Registration Chair
Susumu Tokumoto, FUJITSU LABORATORIES LTD., Japan

Proceedings Chairs
Hideo Tanida, Fujitsu Laboratories Ltd., Japan
Tomohiko Takagi, Kagawa University, Japan

Publicity Chair
Toshiaki Aoki, Japan Advanced Institute of Science and Technology, Japan

Social Networking Chair
Keizo Tatsumi, ASTER, Japan

Local Arrangements Chairs
Satomi Yoshizawa, NEC Corporation, Japan
Chio Fujimoto, OPTiM Corporation, Japan

Web Chair
Saiji Nema, NEC Informatec Systems, Japan

Tutorial Chair
Shuji Morisaki, Nagoya University, Japan

Marketing Chair for Japan
Masato Matsuoka, Kaspersky Labs, Japan

Marketing Chairs for Europe
Michael Mlynarski, QualityMinds GmbH, Germany
Andrej Pietschker, Giesecke & Devrient GmbH, Germany

Marketing Chair for USA
Adam Porter, University of Maryland, USA

Marketing Chair for Near East
Shlomo Mark, SCE - Shamoon College of Engineering, Dean, Software Engineering Department, Israel

Asia Symposium Chairs
Tăng Nguyễn, Hanoi University of Industry, Vietnam
Dan Hao, Peking University, China

Steering Committee
Lionel Briand, Université du Luxembourg, Luxembourg
Myra Cohen, University of Nebraska - Lincoln, USA
Robert Feldt, Blekinge Institute of Technology, Sweden
Gordon Fraser (Chair), University of Sheffield, UK
Mark Grechanik, University of Illinois at Chicago, USA
Darko Marinov, University of Illinois at Urbana-Champaign, USA
Jeff Offutt, George Mason University, USA
John Penix, Google, USA
Franz Wotawa, Graz University of Technology, Austria

Program Committee: Research Track
Shaukat Ali, Simula Research Laboratory, Norway
Nadia Alshahwan, University College London, UK
Anneliese Andrews, University of Denver, USA
Paul Baker, Visa, UK
Fevzi Belli, University of Paderborn, Germany
Cristiano Bertolini, Universidade Federal de Santa Maria, Brazil
Bob Binder, Software Engineering Institute | Carnegie Mellon University, USA
Kirill Bogdanov, The University of Sheffield, UK
Ana Cavalli, Institut National des Telecommunications, France
Byoungju Choi, Ewha Womans University, Korea
Marcelo d'Amorim, Federal University of Pernambuco, Brazil
Juergen Dingel, Queen's University, Canada
Rachida Dssouli, Concordia University, Canada
Stephen Edwards, Virginia Tech, USA
Michael Felderer, University of Innsbruck, Austria
Robert Feldt, Blekinge Institute of Technology, Sweden
Franck Fleurey, SINTEF, Norway
Marcelo Frias, Buenos Aires Institute of Technology, Argentina
Sudipto Ghosh, Colorado State University, USA
Jens Grabowski, Gottingen University, Germany
Mark Harman, University College London, UK
Hadi Hemmati, University of Manitoba, Canada
Robert Hierons, Brunel University, UK
Muhammad Zohaib Iqbal, FAST-NUCE, Pakistan
Raghu Kacker, NIST, USA
Aditya Kanade, Indian Institute of Science, India
Sarfraz Khurshid, University of Texas at Austin, USA
Moonzoo Kim, KAIST, Korea
Yves Le Traon, University of Luxembourg, Luxembourg
Bruno Legeard, Smartesting, France
Nan Li, Medidata Solutions, USA
Mika Mäntylä, University of Oulu, Finland
Eda Marchetti, ISTI-CNR, Italy
Wes Masri, American University of Beirut, Lebanon
Phil McMinn, University of Sheffield, UK
Ali Mesbah, University of British Columbia, Canada
Jürgen Münch, University of Helsinki, Finland
Shiva Nejati, University of Luxembourg, Luxembourg
Manuel Oriol, ABB Corporate Research, Switzerland
Mike Papadakis, University of Luxembourg, Luxembourg
Corina Pasareanu, CMU/NASA Ames Research Center, USA
Paul Pettersson, Mälardalen University, Sweden
Mauro Pezzé, University of Lugano, Switzerland
Lori Pollock, University of Delaware, USA
Mukul Prasad, Fujitsu, USA
Alexander Pretschner, Technische Universitaet Muenchen, Germany
Brian Robinson, ABB Inc. - US Corporate Research, USA
Abhik Roychoudhury, National University of Singapore, Singapore
Per Runeson, Lund University, Sweden
Neha Rungta, NASA Ames Research Center, USA
Ina Schäfer, University of Braunschweig, Germany
Itai Segall, Bell Labs, Nokia, Israel
Junaid Haroon Siddiqui, LUMS, Pakistan
Saurabh Sinha, IBM Research, India
Paul Strooper, The University of Queensland, Australia
Nikolai Tillmann, Facebook, USA
Paolo Tonella, Fondazione Bruno Kessler – IRST, Italy
T.H. Tse, The University of Hong Kong, Hong Kong
Tadahiro Uehara, Fujitsu Laboratories, Japan
Mark Utting, University of Waikato, New Zealand
Guowei Yang, Texas State University, USA
Zijiang Yang, Western Michigan University, USA
Shin Yoo, KAIST, Korea
Fadi Zaraket, American University of Beirut, Lebanon
Lingming Zhang, University of Texas at Dallas, USA
Peter Zimmerer, Siemens AG, Germany

Program Committee: Testing Tools Papers Track
Mariano Ceccato, Fondazione Bruno Kessler, Italy
Eun-Hye Choi, AIST, Japan
Damiano Distante, Unitelma Sapienza University, Italy
Takashi Ishio, Osaka University, Japan
Yang Liu, Nanyang Technological University, Singapore
Ana Paiva, Faculty of Engineering of the University of Porto, Portugal
Karthik Pattabiraman, The University of British Columbia, Canada

Alexander Pretschner, Technische Universität München, Germany
José Miguel Rojas, University of Sheffield, UK
Stefano Scala, Fiat Chrysler Automobiles, Italy
Hideo Tanida, Fujitsu Laboratories Ltd., Japan
Porfirio Tramontana, Università degli Studi di Napoli Federico II, Italy
Xiao Qu, ABB Corporate Research, USA
Zijiang Yang, Western Michigan University, USA

Program Committee: Industry Track
Cyrille Artho, AIST, Japan
Ishan Banerjee, VMware, USA
Teng Long, Google, USA
Adithya Nagarajan, Apple, USA
Hung Nguyen, Google, USA
John Penix, Google, USA
Qing Xie, Auction.com, USA

Program Committee: Posters Track
Ceren Şahin Gebizli, Vestel, Turkey
Teemu Kanstrén, VTT, Finland
Atif Memon, University of Maryland, USA
Olli-Pekka Puolitaival, Polar Electro, Finland

Local Arrangement Committee
Leslie Anne James, OPTiM Corporation, Japan
Saori Egawa, ASTER, Japan

Additional Reviewers: Research Track
Mahmoud Abdelgawad, Abbas Ahmad, Tolga Ayav, Önder Babur, Abhijeet Banerjee
Lionel Briand, Pamela Carvallo, Adnan Causevic, Aida Causevic, Rahul Kumar Dutta
Michael Emmi, Eduard Paul Enoiu, Elizabeta Fourneret, Gordon Fraser
Aiman Gannous, Laleh Ghandehari, Maayan Godlstein, Mojdeh Golagha, Mark Grechanik
Nicolas Hili, Andreas Johnsen, Rashid Kaleem, Mikhail Kazdagli, Muhammad Uzair Khan
Dongsun Kim, Hyunwoo Kim, Yunho Kim, Matthias Kowal, Vinh Hoa La, Remo Lachmann
Li Li, Kui Liu, Jorge Lopez, Hong Lu, Daniel Luchaup, Tao Ma, Nesredin Mahmud
Dongyu Mao, Raluca Marinescu, Darko Marinov, Sergey Mechtaev, Eric Mercer
Aurélien Monot, Hussan Munir, Phu Nguyen, Jeff Offutt, Raquel Oliveira
Georges Ouffoué, John Penix, Gilles Perrouin, Fabien Peureux, Quoc-Sang Phan
Dipesh Pradhan, Tim Rohlfs, Rasmus Ros, Ripon Saha, Raul Armando Fuentes Samaniego
Gehan Selim, Shin Hwei Tan, Bissyandé Tegawende, Oksana Tkachuk, Tugkan Tuglular
Michael Wahler, Kaiyuan Wang, Mingzhong Wang, Shuai Wang, Franz Wotawa
Woong-Gyu Yang, Man Zhang

Conference Sponsors

IEEE
IEEE computer society
ASTER
WASEDA University

Platinum Sponsors

JSTQB

Gold Sponsors

VERISERVE
MITSUBISHI ELECTRIC
Changes for the Better

Silver Sponsors

NEC
JNOVEL

Bronze Sponsors

Google
UEC TOKYO
HITACHI

Copper Sponsors

UMIACS
University of Maryland Institute for Advanced Computer Studies
COMPUTER SCIENCE
UNIVERSITY OF MARYLAND

Government Sponsorship

IPA Better Life with IT

Special Sponsorship

JUSE
Union of Japanese Scientists and Engineers

Supporters

SS
Information Processing Society of Japan
YK

Keynote Speakers

Keynote 1: The State of Continuous Integration Testing at Google

Speaker
John Micco, Google, USA

Abstract
We are always working on improving the efficiency of our developers' core workflows by providing better and faster tooling and processes for testing their code submissions. This talk will describe some of the most interesting problems (such as scalability and flaky tests) that we are finding in the developer workflow and how we are working to improve core testing workflows for all Google engineers.

Bio
John Micco is a senior manager at Google focusing on the internal Continuous Integration Testing and Continuous Deployment systems. He has been working in the software industry for 30 years and working on CI / CD solutions for the last 12 years.

Keynote 2: Testing and Validation Requirements for Automated Driving Technology

Speaker
Kenji Nishikawa, Toyota Motor Corporation, Japan

Abstract
Development of automated driving system is in transition from experimental phase to actual implementation phase.
This talk will describe about the system trend which utilizes various automated driving technology and the revolution of system development process which imposes new/additional system validation requirements

Bio
Kenji Nishikawa is a General Manager at Toyota. He has been working on system/software development of automotive control systems for more than 20 years and is currently responsible for the development of basic software including testing and validation of communication software for Toyota vehicles. He is also a steering committee member of AUTOSAR Development Partnership which is an industry wide standardization activity for automotive basic software.

Keynote 3: Model-Based Testing and Model Inference: Better Together!

Speaker
Andreas Zeller, Software Engineering Chair
Saarland University - Computer Science

Abstract
Model-based testing techniques allow for a thorough exploration of the program behavior, but require a model in the first place. Model inference techniques, on the other hand, promise to extract suitable models from program executions, but require these very executions in the first place. Is there a way out of this chicken-and-egg problem? In this talk, I suggest to conduct both testing and inference at the system interface, which allows a clear distinction between valid and invalid inputs, and effectively allows to both test and infer models at the same time. Given only a program without any sample inputs, our AUTOGRAM prototype uses parser-directed test generation to infer a context-free grammar that models the program input; this grammar can be immediately used to synthesize millions of valid inputs.

Bio
Andreas Zeller is a full professor for Software Engineering at Saarland University in Saarbrücken, Germany, since 2001. His research concerns the analysis of large software systems and their development process. In 2010, Zeller was inducted as Fellow of the ACM for his contributions to automated debugging and mining software archives, for which he also was awarded 10-year impact awards from ACM SIGSOFT and ICSE. In 2011, he received an ERC Advanced Grant, Europe's highest and most prestigious individual research grant, for work on specification mining and test case generation. In 2013, Zeller co-founded Testfabrik AG, a start-up on automatic testing of Web applications, where he chairs the supervisory board.

ICST 2017 Program at a Glance

Rxx: Research full paper sessions, Sxx: Research short paper sessions, Txx: Tool paper sessions, Ixx: Industry paper sessions, Dxx: Tool demo sessions, Cxx: Testing contest, Axx/J01: Special sessions

Mon. March 13 — Workshops & Co-located Events Day — Mon. March 13

Room 203	Room 204	Bldg. 62 Conference Room - Medium	Bldg. 62 Conference Room - Large
6th International Workshop on Combinatorial Testing (IWCT 2017)	**1st International Workshop on Testing Extra-Functional Properties and Quality Characteristics of Software Systems (ITEQS 2017)**	**The 12th Workshop on Testing: Academia-Industry Collaboration, Practice and Research Techniques (TAIC PART 2017)**	**The 12th International Workshop on Mutation Analysis (Mutation 2017)**
Scheduled at 9:00 - 18:00	Scheduled at 9:00 - 17:30	Scheduled at 9:00 - 17:00	Scheduled at 9:00 - 17:45

Tue. March 14 — Main Conference Day — Tue. March 14

	Room 201	Room 202	Room 203	Room 204	
9:00 - 9:30	**Opening**				9:00 - 9:30
9:30 - 10:30	**Keynote 1** The State of Continuous Integration Testing at Google *John Micco, Google, USA*				9:30 - 10:30
11:00 - 12:30	**I01: Industry #1**	**R08: Model-Based Testing I**	**R01: Fault Localization and Injection**	**D01: Introduction of the Tools to be Demonstrated**	11:00 - 12:30
14:00 - 15:30	**R02: Debugging, Composite Faults and Complexity Analysis**	**T01: Model Checking and DSL-based Testing**	**R09: Model-Based Testing II**	**D02-03: Live Demonstrations**	14:00 - 15:30
16:00 - 17:30	**R03: Security Testing**	**S01: New Methods and Empirical Results (short papers)**	**J01: Special Session - Demands and Efforts in Software Engineering and IV&V among Japanese government and a company**		16:00 - 17:30
19:00 - 21:00	**Welcome Reception at a Cafeteria on the 1st Floor of Building 63**				19:00 - 21:00

Wed. March 15 — Main Conference Day — Wed. March 15

	Room 201	Room 202	Room 203	Room 204	
9:15 - 9:30	**Opening**				9:15 - 9:30
9:30 - 10:30	**Keynote 2** Testing and Validation Requirements for Automated Driving Technology *Kenji Nishikawa, Toyota Motor Corporation, Japan*				9:30 - 10:30
11:00 - 12:30	**I02: Industry #2**	**R10: Automated and Run-time Testing**	**R04: Regression Testing**	**C01: Testing contest #1**	11:00 - 12:30
14:00 - 15:30	**A01: Special Session - Aerospace IV&V #1**	**R05: Web and Mobile Applications**	**S02: New Theories and Tools (short papers)**	**C02: Testing contest #2**	14:00 - 15:30
16:00 - 17:30	**A02: Special Session - Aerospace IV&V #2**	**T02: Code Analysis and White Box Testing**	**R06: Parallel Systems and Concurrency**	**C03: Testing contest #3**	16:00 - 17:30
19:30 - 21:30	**Banquet at "SUNSHINE CRUISE CRUISE" in Ikebukuro** (chartered buses from the university are available)				19:30 - 21:30

Thu. March 16 — Main Conference Day — Thu. March 16

	Room 201	Room 202	Room 203	Room 204	
9:15 - 9:30	**Opening**				9:15 - 9:30
9:30 - 10:30	**Keynote 3** Model-Based Testing and Model Inference: Better Together! *Andreas Zeller, Saarland University, Germany*				9:30 - 10:30
11:00 - 12:30	**F01: Tutorial**	**R07: Empirics on Testing**	**R11: Search-Based Testing**		11:00 - 12:30
14:00 - 15:30	**P01: Panel**	**T03: Dynamic Analysis**	**R12: Model Checking and Verification**		14:00 - 15:30
16:00 - 17:30	**Open Steering Committee & Closing**				16:00 - 17:30

Fri. March 17 — Workshops & Doctoral Symposium Day — Fri. March 17

Room 201	Room 202	Room 203	Room 204
13th Workshop on Advances in Model Based Testing (A-MOST 2017)	**4th International Workshop on Software Test Architecture (InSTA 2017)**	**ICST Doctoral Symposium**	**The First Asian Symposium on Collaborative Software Engineering (ACSE 2017)**
Scheduled at 9:00 - 17:30	Scheduled at 9:00 - 17:00	Scheduled at 9:00 - 15:30	Scheduled at 9:30 - 15:00

Mon. March 13

6th International Workshop on Combinatorial Testing (IWCT 2017)

Room 203

8:15 -	**Registration & Breakfast**
9:00 - 10:40	**Session 1: Test Case Generation & Quality Assessment** A Model for t-way Fault Profile Evolution During Testing *D. Richard Kuhn, Raghu N. Kacker and Yu Lei* Mutation Score, Coverage, Model Inference: Quality Assessment For t-way Combinatorial Test-Suites *Hermann Felbinger, Franz Wotawa and Mihai Nica* Optimizing IPOG's Vertical Growth with Constraints Based on Hypergraph Coloring *Feng Duan, Yu Lei, Linbin Yu, Raghu N. Kacker and D. Richard Kuhn* Test Case Generation with Regular Expressions and Combinatorial Techniques *Macario Polo, Francisco Ruiz Romero, Rosana Rodríguez-Bobada Aranda and Ignacio García-Rodríguez*
10:40 - 11:00	**Coffee Break**
11:00 - 12:05	**Session 2: Applications of Combinatorial Testing: I** Applying Combinatorial Testing to High-Speed Railway Track Circuit Receiver *Chang Rao, Jin Guo, Nan Li, Yu Lei, Yadong Zhang, Yao Li and Yaxin Cao* Applications of Practical Combinatorial Testing Methods at Siemens Industry Inc., Building Technologies Division *Murat Ozcan* Using Timed Base-Choice Coverage Criterion for Testing Industrial Control Software (short 15 mins.) *Henning Bergstrom and Eduard Enoiu*
12:05 - 12:30	**Session 3: Poster Session** (at the Lobby) Finding Minimum Locating Arrays Using a SAT Solver *Tatsuya Konishi, Hideharu Kojima, Hiroyuki Nakagawa and Tatsuhiro Tsuchiya* Test Optimization using Combinatorial Test Design *Saritha Route*
12:30 - 14:00	**Lunch** (with Poster Session continued)
14:00 - 15:30	**Session 4: Modelling** Building Combinatorial Test Input Model from Use Case Artefacts *Preeti S, Milind B, Medhini S. Narayan and Krishnan Rangarajan* Combinatorial Methods for Modelling Composed Software Systems *Ludwig Kampel, Bernhard Garn and Dimitris E. Simos* Combinatorial Interaction Testing for Automated Constraint Repair *Angelo Gargantini, Justyna Petke and Marco Radavelli* A Composition-Based Method for Combinatorial Test Design (short 15 mins) *Anna Zamansky, Amir Schwartz, Sery Khoury and Eitan Farchi*
15:30 - 16:00	**Coffee Break**
16:00 - 17:05	**Session 5: Applications of Combinatorial Testing: II** Applying Combinatorial Testing to Data Mining Algorithms Jaganmohan Chandrasekaran, Huadong Feng, Yu Lei, D. Richard Kuhn and Raghu N. Kacker Combinatorial Testing on Implementations of HTML5 Support Xi Deng, Tianyong Wu, Jun Yan and Jian Zhang Combinatorial Testing on MP3 for Audio Players (short 15 mins) Shaojiang Wang, Tianyong Wu, Yuan Yao, Beihong Jin and Liping Ding

1st International Workshop on Testing Extra-Functional Properties and Quality Characteristics of Software Systems (ITEQS 2017)

Room 204

8:15 -	**Registration & Breakfast**
9:00 - 9:05	Opening
9:05 - 10:00	Scalable Software Testing and Verification Through Heuristic Search and Optimization: Experiences and Lessons Learned (Keynote 1) *Prof. Lionel Briand, University of Luxembourg*
10:00 - 10:30	A Process for Sound Conformance Testing of Cyber-Physical Systems *Hugo Araujo, Gustavo Carvalho, Augusto Sampaio, Mohammad Reza Mousavi, Masoumeh Taromirad*
10:30 - 11:00	**Coffee Break**
11:00 - 12:30	Testing Cache Side-channel Leakage *Tiyash Basu, Sudipta Chattopadhyay* Simulation-Based Safety Testing Brake-By-Wire *Nils Mullner, Saifullah Khan, Md. Habibur Rahman, Wasif Afzal, Mehrdad Saadatmand* Targeted Mutation: Efficient Mutation Analysis for Testing Non-Functional Properties *Björn Lisper, Birgitta Lindström, Pasqualina Potena, Mehrdad Saadatmand, Markus Bohlin*
12:30 - 14:00	**Lunch**
14:00 - 15:00	Performance-driven software model refactoring (Keynote 2) *Prof. Vittorio Cortellessa, University of L'Aquila*
15:00 - 15:30	Automatic Test Generation for Energy Consumption of Embedded Systems Modeled in EAST-ADL *Raluca Marinescu, Eduard Paul Enoiu, Cristina Seceleanu, Daniel Sundmark*
15:30 - 16:00	**Coffee Break**
16:00 - 17:30	Runtime Verification for Detecting Suspension Bugs in Multicore and Parallel Software *Sara Abbaspour Asadollah, Daniel Sundmark, Hans Hansson* Generating Controllably Invalid and Atypical Inputs for Robustness Testing *Simon Poulding, Robert Feldt* Panel Discussion: Challenges of Testing EFPs
17:30	Closing

The 12th Workshop on Testing: Academia-Industry Collaboration, Practice and Research Techniques (TAIC PART 2017)

Bldg. 62 Conference Room - Medium

8:15 -	**Registration & Breakfast**
9:00 - 9:10	Opening
9:10 - 10:00	Keynote I: Challenges to Improve the Confidence in Cyber-Physical Systems *Tetsuya Tohdo, DENSO CORPORATION, Japan*
10:00 - 10:30	Coverage-Based Reduction of Test Execution Time: Lessons from a Very Large Industrial Project *Thomas Bach, Artur Andrzejak and Ralf Pannemans*
10:30 - 11:00	**Coffee Break**
11:00 - 12:30	Are CISQ Reliability Measures Practical? A Research Perspective *Johannes Bräuer, Reinhold Plösch and Manuel Windhager* Impact of Education and Experience Level on the Effectiveness of Exploratory Testing: An Industrial Case Study *Ceren Şahin Gebizli and Hasan Sözer* A Test Case Recommendation Method Based on Morphological Analysis, Clustering and the Mahalanobis-Taguchi Method *Hirohisa Aman, Takashi Nakano, Hideto Ogasawara and Minoru Kawahara*
12:30 - 14:00	**Lunch**
14:00 - 14:20	Results of a Comparative Study of Code Coverage Tools in Computer Vision *Iulia Nica, Gerhard Jakob, Kathrin Juhart, and Franz Wotawa*
14:20 - 14:40	Test Case Generation and Prioritization: A Process-mining Approach *Andrea Janes*
14:40 - 15:30	Keynote II: Software Testing in Industry and Academia: A View of Both Sides in Japan *Satoshi Masuda, IBM Research - Tokyo, Japan*
15:30 - 16:00	**Coffee Break**
16:00 - 16:50	Open Session
16:50 - 17:00	Best Paper Award & Closing

The 12th International Workshop on Mutation Analysis (Mutation 2017)

Bldg. 62 Conference Room - Large

8:15 -	**Registration & Breakfast**
9:00 - 10:30	Opening Keynote 1: Mutation testing – a practitioner's perspective *Henry Coles* MutRex: a mutation-based generator of fault detecting strings for regular expressions *Paolo Arcaini, Angelo Gargantini and Elvinia Riccobene*
10:30 - 11:00	**Coffee Break**
11:00 - 12:30	**Session: Mutant Reduction and Equivalence Detection** Are Deletion Mutants Easier to Identify Manually? *Vinicius Durelli, Nilton de Souza and Marcio Eduardo Delamaro* Finding Redundancy in Web Mutation Operators *Upsorn Praphamontripong and Jeff Offutt* Reducing Mutants with Mutant Killable PreCondition *Chihiro Iida and Shingo Takada* Speeding-up mutation testing via data compression and state infection *Qianqian Zhu, Annibale Panichella and Andy Zaidman*
12:30 - 14:00	**Lunch**
14:00 - 15:30	Keynote 2: Mutation analysis for the real world: effectiveness, efficiency, and proper tool support *René Just* **Session: Empirical Studies** Applying Mutation Analysis On Kernel Test Suites: An Experience Report *Iftekhar Ahmed, Carlos Jensen, Alex Groce and Paul McKenney* How Good are Your Types? Using Mutation Analysis to Evaluate the Effectiveness of Type Annotations *Rahul Gopinath and Eric Walkingshaw*
15:30 - 16:00	**Coffee Break**
16:00 - 17:00	**Session: Operator Design and Tool Development** Towards Security-aware Mutation Testing *Thomas Loise, Xavier Devroey, Gilles Perrouin, Mike Papadakis and Patrick Heymans* Mutation patterns for temporal requirements of reactive systems *Mark Trakhtenbrot* An architecture for the development of mutation operators *Macario Polo, Gonzalo Rojas, Isyed Rodríguez and Suilen Hernández*
17:00 - 17:45	Panel: From Academia to Industry and Back Again Closing

Tue. March 14

	Room 201	Room 202	Room 203	Room 204	
8:15 -	**Registration & Breakfast**				8:15 -
9:00 - 9:30	**Opening** (Chairs: *Atif Memon* and *Yasuharu Nishi*)				9:00 - 9:30
9:30 - 10:30	**Keynote 1** (Chair: *Atif Memon*) The State of Continuous Integration Testing at Google *John Micco, Google, USA*				9:30 - 10:30
10:30 - 11:00	**Coffee Break**				10:30 - 11:00
11:00 - 12:30	**I01: Industry #1** (Chair: *Murat Ozturk*) Towards A Testbed for Automotive Cybersecurity *Daniel S. Fowler, Madeline Cheah, Siraj Ahmed Shaikh and Jeremy Bryans* How to Test in Sixteen Languages? Automation Support for Localization Testing *Rudolf Ramler and Robert Hoschek*	**R08: Model-Based Testing I** (Chair: *Shaukat Ali*) Non-Semantics-Preserving Transformations For Higher-Coverage Test Generation Using Symbolic Execution *Hayes Converse, Oswaldo Olivo and Sarfraz Khurshid* Uncertainty-Driven Black-Box Test Data Generation *Neil Walkinshaw and Gordon Fraser* Automated Test Generation and Mutation Testing for Alloy *Allison Sullivan, Kaiyuan Wang, Razieh Nokhbeh Zaeem and Sarfraz Khurshid*	**R01: Fault Localization and Injection** (Chair: *Mike Papadakis*) Localizing Faults in SQL Predicates *Yun Guo, Amihai Motro and Nan Li* Prevalence of Single-Fault Fixes and its Impact on Fault Localization *Alexandre Perez, Rui Abreu and Marcelo d'Amorim* FIFA: A Kernel-Level Fault Injection Framework for ARM-based Embedded Linux System *Eunjin Jeong, Namgoo Lee, Jinhan Kim, Duseok Kang and Soonhoi Ha*	**D01: Introduction of the Tools to be Demonstrated** (Chair: *Ana Paiva*) Presentations on the tools to be demonstrated in **D02-D03: Live Demonstrations** (10 minutes each, in the order listed in the program for D02-D03)	11:00 - 12:30
12:30 - 14:00	**Lunch**				12:30 - 14:00
14:00 - 15:30	**R02: Debugging, Composite Faults and Complexity Analysis** (Chair: *Jose Miguel Rojas*) Using Delta Debugging to Minimize Stress Tests for Concurrent Data Structures *Jing Xu, Yu Lei and Richard Carver* The Theory of Composite Faults *Rahul Gopinath, Carlos Jensen and Alex Groce* Symbolic Complexity Analysis using Context-preserving Histories *Kasper Luckow, Rody Kersten and Corina Pasareanu*	**T01: Model Checking and DSL-based Testing** (Chair: *Eun-Hye Choi*) NIVAnalyzer: a Tool for Automatically Detecting and Verifying Next-Intent Vulnerabilities in Android Apps *Junjie Tang, Xingmin Cui, Ziming Zhao, Shanqing Guo, Xinshun Xu, Chengyu Hu, Tao Ban and Bing Mao* Efficient Safety Proofs for Industry-Scale Code using Abstractions and Bounded Model Checking *Priyanka Darke, Bharti Chimdyalwar, Avriti Chauhan and R. Venkatesh* NuSeen: a tool framework for the NuSMV model checker *Paolo Arcaini, Angelo Gargantini and Elvinia Riccobene*	**R09: Model-Based Testing II** (Chair: *Nan Li*) Model-Based Testing IoT Communication via Active Automata Learning *Martin Tappler, Bernhard K. Aichernig and Roderick Bloem* Model-based API Testing of Apache ZooKeeper *Cyrille Valentin Artho, Quentin Gros, Guillaume Rousset, Kazuaki Banzai, Lei Ma, Takashi Kitamura, Masami Hagiya, Yoshinori Tanabe and Mitsuharu Yamamoto* System Testing of Timing Requirements based on Use Cases and Timed Automata *Chunhui Wang, Fabrizio Pastore and Lionel Briand*	**D02-03: Live Demonstrations** (Chair: *Bruno Lima*) Non-intrusive performance measurement framework for desktop apps *Fu-Hung Yen, Ming-Da Ho, Shao-Chieh Lien and Walter* APITester: API Testing Based on Interface Semantic Contract *Xinxin Zhuo, Xiaoying Bai, Jing Xu, Wenli Song, Yu Liu, Jiehui Kang and Enpeng Li* Accelerating Test Automation using a Domain Specific Language: Tool Demo *Dipin Era, Catherine Moolayil, Anurag Dwarakanath, Neville Dubash and Sanjay Podder* Test Design as Code: JCUnit *Hiroshi Ukai and Xiao Qu* ADRENALIN-RV: Android Runtime Verification using Load-time Weaving *Haiyang Sun, Andrea Rosà and Walter Binder* Code Defenders: A Mutation Testing Game (DEMO) *Thomas D White, José Miguel Rojas and Gordon Fraser* Roper: An Enterprise-level invariant-based testing tool for websites *Jordi Carres, Nan Li and Charles Abbott* (All authors will be available to demostrate their tools during D02-D03 sessions all the time)	14:00 - 15:30
15:30 - 16:00	**Coffee Break**				15:30 - 16:00
16:00 - 17:30	**R03: Security Testing** (Chair: *Franz Wotawa*) Coveringcerts: Combinatorial Methods for X.509 Certificate Testing *Kristoffer Kleine and Dimitris E. Simos* Recovering Semantic Traceability Links between APIs and Security Vulnerabilities: An Ontological Modeling Approach *Sultan Alqahtani, Ellis E. Eghan and Juergen Rilling* Mining Sandboxes for Linux Containers *Zhiyuan Wan, David Lo, Xin Xia, Liang Cai and Shanping Li*	**S01: New Methods and Empirical Results (short papers)** (Chair: *Zijiang James Yang*) A Comparative Study of Manual and Automated Testing for Industrial Control Software *Eduard Enoiu, Adnan Causevic, Daniel Sundmark and Paul Pettersson* How Do Assertions Impact Coverage-based Test-Suite Reduction? *Junjie Chen, Yanwei Bai, Dan Hao, Lingming Zhang, Lu Zhang and Bing Xie* Automata Language Equivalence vs. Simulations for Model-based Mutant Equivalence: An Empirical Evaluation *Xavier Devroey, Gilles Perrouin, Mike Papadakis, Axel Legay, Pierre-Yves Schobbens and Patrick Heymans* Assessing and Improving the Mutation Testing Practice of PIT *Thomas Laurent, Mike Papadakis, Marinos Kintis, Christopher Henard, Yves Le Traon and Anthony Ventresque*	**J01: Special Session - Demands and Efforts in Software Engineering and IV&V among Japanese government and a company** (Chair: *Tetsuro Katayama*) Aiming to realize a “Reliable IT Society” *Tatsuo Tomita, Information-technology Promotion Agency (IPA), Japan* Systematic Approach toward Dependable System Development *Takaaki Matsumoto, Information-technology Promotion Agency (IPA), Japan* R&D activities on test processes, analysis and design in VeriServe Corporation *Koichi Tanizaki, VeriServe Corporation, Japan*		16:00 - 17:30
19:00 - 21:00	**Welcome Reception at a Cafeteria on the 1st Floor of Building 63**				19:00 - 21:00

Wed. March 15

	Room 201	Room 202	Room 203	Room 204	
8:30 -	**Registration & Breakfast**				8:30 -
9:15 - 9:30	**Opening** (Chairs: *Atif Memon* and *Yasuharu Nishi*) Introduction of JSTQB and its activities *Keiji Uetsuki, JSTQB Technical Committee, Japan*				9:15 - 9:30
9:30 - 10:30	**Keynote 2** (Chair: *Hironori Washizaki*) Testing and Validation Requirements for Automated Driving Technology *Kenji Nishikawa, Toyota Motor Corporation, Japan*				9:30 - 10:30
10:30 - 11:00	**Coffee Break**				10:30 - 11:00
11:00 - 12:30	**I02: Industry #2** (Chair: *Bao Nguyen*) Information Needs for Validating Evolving Software Systems: An Exploratory Study at Google *Abdullah Al-Nayeem, Krzystof Ostrowski, Sebastian Pueblas, Christophe Restif and Sai Zhang* A Controlled Experiment on Coverage Maximization of Automated Model-Based Software Test Cases in the Automotive Industry *Rashid Darwish, Lynnie Nakyanzi Gwosuta and Richard Torkar* An Industrial Study of Natural Language Processing Based Test Case Prioritization *Yilin Yang, Xinhai Huang, Xuefei Hao, Zicong Liu and Zhenyu Chen*	**R10: Automated and Run-time Testing** (Chair: *Zijiang James Yang*) Efficient Incrementalized Runtime Checking of Linear Measures on Lists *Alex Gyori, Pranav Garg, Edgar Pek and P. Madhusudan* Behavioral Execution Comparison: Are Tests Representative of Field Behavior? *Qianqian Wang, Yuriy Brun and Alessandro Orso* Automated Random Testing in Multiple Dispatch Languages *Simon Poulding and Robert Feldt*	**R04: Regression Testing** (Chair: *Shin Yoo*) Perphecy: Performance Regression Test Selection Made Simple but Effective *Augusto Born de Oliveira, Sebastian Fischmeister, Amer Diwan, Matthias Hauswirth and Peter F. Sweeney* A Selection Method for Black Box Regression Testing with a Statistically Defined Quality Level *Ibrahim Alagöz, Thomas Herpel and Reinhard German* Private API Access and Functional Mocking in Automated Unit Test Generation *Andrea Arcuri, Gordon Fraser and René Just*	**C01: Testing contest #1** (Chairs: *Emil Alégroth* and *Tanja E. J. Vos*) Welcome and introduction to the contest *Emil Alégroth, Blekinge Institute of Technology, Sweden* *Tanja E.J Vos, Open Universiteit, The Netherlands* Start competing with your solution! Try to find as many failures as you can in the mutated version of TESTONA.	11:00 - 12:30
12:30 - 14:00	**Lunch**				12:30 - 14:00
14:00 - 15:30	**A01: Special Session - Aerospace IV&V: Why and how we use software testing to trust products #1** (Chair: *Naoki Ishihama*) Usage of software testing at NASA IV&V (with VIDEO) *Justin R. Morris, NASA* How European Space Agency are using Independent Software Verification and Validation for Flight Software Development *Maria Hernek, ESA* How JAXA uses software testing for IV&V, and what is the needs *Naoko Okubo, JAXA*	**R05: Web and Mobile Applications** (Chair: *Nan Li*) Using Semantic Similarity in Crawling-based Web Application Testing *Jun-Wei Lin, Farn Wang and Paul Chu* Barista: A Technique for Recording, Encoding, and Running Platform Independent Android Tests *Mattia Fazzini, Eduardo Noronha De A. Freitas, Shauvik Roy Choudhary and Alessandro Orso* ATOM: Automatic Maintenance of GUI Test Scripts for Evolving Mobile Applications *Xiao Li, Nana Chang, Yan Wang, Haohua Huang, Yu Pei, Linzhang Wang and Xuandong Li*	**S02: New Theories and Tools (short papers)** (Chair: *Robert Feldt*) Generic and Effective Specification of Structural Test Objectives *Michael Marcozzi, Mickael Delahaye, Sebastien Bardin, Nikolay Kosmatov and Virgile Prevosto* Ariadne: Hybridizing Directed Model Checking and Static Analysis *Reed Milewicz and Peter Pirkelbauer* A Toolkit for Testing Stochastic Simulations against Statistical Oracles *Matthew Patrick, Ruairi Donnelly and Christopher A. Gilligan* O!Snap: Cost-Efficient Testing in the Cloud *Alessio Gambi, Alessandra Gorla and Andreas Zeller*	**C02: Testing contest #2** (Chair: *Kinji Akemine*) Continue to compete with your solution! Try to find as many failures as you can in the mutated version of TESTONA.	14:00 - 15:30
15:30 - 16:00	**Coffee Break**				15:30 - 16:00
16:00 - 17:30	**A02: Special Session - Aerospace IV&V: Why and how we use software testing to trust products #2** (Chair: *Naoki Ishihama*) Integrated Formal Analysis for Software IV&V *Hideki Nomoto, JAMSS* Panel Discussion with audience: The needs for software testing from Aerospace IV&V domain and Testing technology Moderator: *Masafumi Katahira, JAXA* Panelists: *Maria Hernek, ESA* *Naoko Okubo, JAXA* *Hideki Nomoto, JAMSS* *Takao Futagami, TOYO Corp.* *Koichi Tanizaki, VeriServe Corp.*	**T02: Code Analysis and White Box Testing** (Chair: *Anna Rita Fasolino*) Transferring State-of-the-art Immutability Analyses: Experimentation Toolbox and Accuracy Benchmark *Benjamin Holland, Ganesh Ram Santhanam and Suresh Kothari* Accelerating Test Automation through a Domain Specific Language *Anurag Dwarakanath, Dipin Era, Aditya Priyadarshi, Neville Dubash and Sanjay Podder* Taming Coverage Criteria Heterogeneity with LTest *Michaël Marcozzi, Sébastien Bardin, Mickaël Delahaye, Nikolai Kosmatov and Virgile Prevosto* Test Design as Code: JCUnit *Hiroshi Ukai and Xiao Qu*	**R06: Parallel Systems and Concurrency** (Chair: *Hironori Washizaki*) Automated Testing of Definition-Use Data Flow for Multithreaded Programs *Xiaodong Zhang, Zijiang Yang, Qinghua Zheng, Pei Liu, Jialiang Chang, Yu Hao and Ting Liu* IPA: Error Propagation Analysis of Multi-Threaded Programs Using Likely Invariants *Abraham Chan, Stefan Winter, Habib Saissi, Karthik Pattabiraman and Neeraj Suri* Verifying Concurrent Programs using Contracts *Ricardo Dias, Carla Ferreira, Jan Fiedor, João Lourenço, Ales Smrcka, Diogo G. Sousa and Tomas Vojnar*	**C03: Testing contest #3** (Chair: *Shinsuke Matsuki*) Continue to compete with your solution! Try to find as many failures as you can in the mutated version of TESTONA. Anounce the winner and prize award *Shinsuke Matsuki, Veriserve Corporation, Japan* *Kinji Akemine, NTT DATA Corp, Japan*	16:00 - 17:30
19:30 - 21:30	**Banquet at "SUNSHINE CRUISE CRUISE" in Ikebukuro** (chartered buses from the university are available)				19:30 - 21:30

Thu. March 16

	Room 201	Room 202	Room 203	Room 204	
8:30 -	**Registration & Breakfast**				8:30 -
9:15 - 9:30	**Opening** (Chairs: *Atif Memon* and *Yasuharu Nishi*)				9:15 - 9:30
9:30 - 10:30	**Keynote 3** (Chair: *Ina Schieferdecker*) Model-Based Testing and Model Inference: Better Together! *Andreas Zeller, Saarland University, Germany*				9:30 - 10:30
10:30 - 11:00	**Coffee Break**				10:30 - 11:00
11:00 - 12:30	**F01: Tutorial** Understanding the UML Testing Profile 2 – A Modelling Language for Test Design *Marc-Florian Wendland, Fraunhofer FOKUS, Germany*	**R07: Empirics on Testing** (Chair: *Mike Papadakis*) Are there any Unit Tests? An Empirical Study on Unit Testing in Open Source Python Projects *Fabian Trautsch and Jens Grabowski* Broadcast vs. Unicast Review Technology: Does it Matter? *Armstrong Tita Foundjem, Foutse Khomh and Bram Adams* JavaScript: The (Un)covered Parts *Amin Milani Fard and Ali Mesbah*	**R11: Search-Based Testing** (Chair: *Shin Yoo*) The Fitness Function for the Job: Search-Based Generation of Test Suites that Detect Real Faults *Gregory Gay* A Search-based Testing Approach for XML Injection Vulnerabilities in Web Applications *Sadeeq Jan, Cu D. Nguyen, Andrea Arcuri and Lionel Briand* CBGA-ES: A Cluster-Based Genetic Algorithm with Elitist Selection for Supporting Multi-objective Test Optimization *Dipesh Pradhan, Shuai Wang, Shaukat Ali, Tao Yue and Marius Liaaen*		11:00 - 12:30
12:30 - 14:00	**Lunch**				12:30 - 14:00
14:00 - 15:30	**P01: Panel** Bleeding-Edge Testing Challenges that the Software Industry Faces - an Invitation to Researchers to Address these Challenges (Chair: *Atif Memon*) *John Micco, Google, USA* *Bao Nguyen, Google, USA* *Murat Ozturk, Google, USA* *Adithya Nagarajan, Apple, USA* Quality and testing in Software Engineering curriculum (Chair: *Shlomo Mark*) *Ina Schieferdeker, Fraunhofer FOKUS, Germany* *Tanja Vos, Open University in The Netherlands, Netherlands* *Shuji Morisaki, Nagoya University, Japan* *Jens Krinke, University College London, United Kingdom* *Shlomo Mark, SCE Israel, Israel*	**T03: Dynamic Analysis** (Chair: *Domenico Amalfitano*) SAGA toolbox: Interactive Testing of Guarded Assertions Daniel Flemström, Thomas Gustafsson and Avenir Kobetski TITAN: Test Suite Optimization for Highly Configurable Software Dusica Marijan, Marius Liaaen, Arnaud Gotlieb, Sagar Sen and Carlo Ieva ADRENALIN-RV: Android Runtime Verification using Load-time Weaving Haiyang Sun, Andrea Rosà, Omar Javed and Walter Binder	**R12: Model Checking and Verification** (Chair: *Darko Marinov*) Incremental Deductive Verification for Relational Model Transformations *Zheng Cheng and Massimo Tisi* Statistical Model Checking Meets Property-Based Testing *Bernhard K. Aichernig and Richard Schumi* Timed k-Tail: Automatic Inference of Timed Automata *Fabrizio Pastore, Daniela Micucci and Leonardo Mariani*		14:00 - 15:30
15:30 - 16:00	**Coffee Break**				15:30 - 16:00
16:00 - 17:30	**Open Steering Committee & Closing** (Chairs: *Atif Memon* and *Yasuharu Nishi*)				16:00 - 17:30

ICST Posters Track (Tue. March 15 - Thu. March 17) - Presented at the Lobby (Chair: *Pekka Aho*)

A Mechanism of Reliable and Standalone Script Generator on Android
Kueichun Liu, Yu-Yu Lai and Ching-Hong Wu

EarthCube Software Testing and Assessement Framework
Emily Law

Using Model-Checking for Timing Verification in Industrial System Design
Laurent Rioux, Rafik Henia and Nicolas Sordon

Challenges of Operationalizing Spectrum-Based Fault Localization from a Data-Centric Perspective
Mojdeh Golagha and Alexander Pretschner

Towards a Gamified Equivalent Mutants Detection Platform
Thomas Laurent, Laura Guillot, Motomichi Toyama, Ross Smith, Dan Bean and Anthony Ventresque

Cloud API Testing
Junyi Wang, Xiaoying Bai, Haoran Ma, Linyi Li and Zhicheng Ji

Automated A/B Testing with Declarative Variability Expressions
Keisuke Watanabe, Takuya Fukamachi, Naoyasu Ubayashi and Yasutaka Kamei

Weighting for Combinatorial Testing by Bayesian Inference
Eun-Hye Choi, Tsuyoshi Fujiwara and Osamu Mizuno

Impact of Static and Dynamic Coverage on Test-Case Prioritization: An Empirical Study
Jianyi Zhou and Dan Hao

BDTest, a System to Test Big Data Frameworks
Alexandre Langeois, Anthony Ventresque and Eduardo Cunha de Almeida

What You See Is What You Test - Augmenting Software Testing with Computer Vision
Rudolf Ramler and Thomas Ziebermayr

Framework for Model-Based Design and Verification of Human-in-the-Loop Cyber-Physical Systems
Filip Cuckov, Grant Rudd and Liam Daly

Automated test case generation from OTS/CafeOBJ specifications by specification translation
Ryusei Mori and Masaki Nakamura

Fri. March 17

Fri. March 17

	13th Workshop on Advances in Model Based Testing (A-MOST 2017)	4th International Workshop on Software Test Architecture (InSTA 2017)	ICST Doctoral Symposium	The First Asian Symposium on Collaborative Software Engineering (ACSE 2017)
	Room 201	Room 202	Room 203	Room 204
8:30 -	**Registration & Breakfast**	**Registration & Breakfast**	**Registration & Breakfast**	**Registration & Breakfast**
9:00 - 10:30	**Keynote Speech 1** The New Version of the UML Testing Profile *Ina Schieferdecker*	**Keynote Speech** Modelling test automation architectures: Integrating ISO 29119, ISTQB, UML Testing Profile 2 and TTCN-3 *Marc-Florian Wendland, Fraunhofer FOKUS*	Localizing and Fixing Faults in SQL Predicates *Yun Guo* Debugging Multithreaded Programs Using Symbolic Analysis *Xiaodong Zhang* Automated and Scalable Mutation Testing *Thierry Titcheu Chekam*	9:30 - 9:40 Welcome Speech 9:40 - 10:40 Testing multithreaded programs as if they were sequential *Zijiang Yang* Randomized test generation methods for model-based control system development *Takashi Tomita*
10:30 - 11:00	**Coffee Break**	**Coffee Break**	**Coffee Break**	**Coffee Break**
11:00 - 12:30	**Paper Session 1: Functional MBT** Mutation-Based Test-Case Generation with Ecdar *Kim G. Larsen, Florian Lorber, Brian Nielsen and Ulrik M. Nyman* Reducing the Concretization Effort in FSM-Based Testing of Software Product Lines *Vanderson Hafemann Fragal, Adenilso Simao, André Takeshi Endo and Mohammad Reza Mousavi* Property-Based Testing with External Test-Case Generators *Bernhard K. Aichernig, Silvio Marcovic and Richard Schumi*	**Emerging** Closing the Gap between Unit Test Code and Documentation *Karsten Stöcker, Hironori Washizaki and Yoshiaki Fukazawa* **Research Paper** Improvement of Description for Reusable Test Type by Using Test Frame *Keiji Uetsuki and Mitsuru Yamamoto* **Accepted Talk** Re-Define the Test Coverage by Law of Large Numbers *Geng Chen*	A Framework for Failure Diagnosis *Mojdeh Golagha* Enhancing Trust- Software Vulnerability Analysis Framework *Sultan Alqahtani* **Faculty Talk** How to Give a Great Presentation *Tanja Vos*	The future directions of crowdsourced testing *Zhenyu Chen* Development of a meteorological observation system using arduino by KOSEN network *Kazuya Kanda* A new random testing-based fault localization approach *Zhenzhen Wang*
12:30 - 14:00	**Lunch**	**Lunch**	**Lunch**	**Lunch**
14:00 - 15:30	**Keynote Speech 2** Uncertainty-Wise Testing *Shaukat Ali*	**Emerging** Suggestion of Practical Quantification Measuring Method of Test Design Which Can Represent The Current Status *Sunil Chon and Jihwan Park* **Emerging** Software Testing Design Techniques Used in Automated Vehicle Simulations *Satoshi Masuda*	Reflecting the Adoption of Software Testing Research in Open-Source Projects *Fabian Trautsch* Abstraction Refinement for Non-Zeno Fairness Verification of Linear Hybrid Automata *Ryo Yanase* **Faculty Talk** How to Get Your Paper Rejected *Jeff Offutt*	Compliance analysis of configurable business process model based on extend CTL *Yiwang Huang* A tool for impact analysis of test cases based on changes in an automotive system *Surasak Phetmanee*
15:30 - 16:00	**Coffee Break**	**Coffee Break**		
16:00 - 17:30	**Paper Session 2: Non-Functional MBT** Planning-based Security Testing of the SSL/TLS Protocol *Josip Bozic, Kristoffer Kleine, Dimitris Simos and Franz Wotawa* Towards Decentralized Conformance Checking in Model-Based Testing of Distributed Systems *Bruno Lima and João Faria* Pattern Based Usability Testing *Fernando Dias and Ana Paiva*	**Research Paper** Analysing Test Basis and Deriving Test Cases Based on Data Design Documents *Tsuyoshi Yumoto, Tohru Matsuodani and Kazuhiko Tsuda* **Emerging** 15:30 - 17:00 Test Conglomeration - Proposal for Test Design Notation Like Class Diagram *Noriyuki Mizuno, Makoto Nakakuki and Yoshinori Seino* **Poster** Defining the Phrase Software Test Architecture *Jon Hagar*		
17:30	Wrap Up and Closing	17:00 Closing		

Each session within Doctoral Symposium consists of 15 minute presentation from a student and 15 minute feedback from panelists.

Panelists:
Jeff (Yu) Lei, University of Texas at Arlington
Mike Papadakis, Luxembourg University
Tanja Vos, Open University
Tingting Yu, University of Kentucky

Welcome Reception – 19:00-21:00 on March 14
At a Cafeteria on the 1st Floor of Building 63

Banquet – 19:30-21:30 on March 15
At “SUNSHINE CRUISE CRUISE”
on the 58th floor of Ikebukuro Sunshine 60
http://bit.ly/2m5WGqe

Going	1st	2nd	3rd	Last
Nishi Waseda	17:35	17:45	18:35	18:45
Sunshine City	18:05	18:15	19:05	19:15

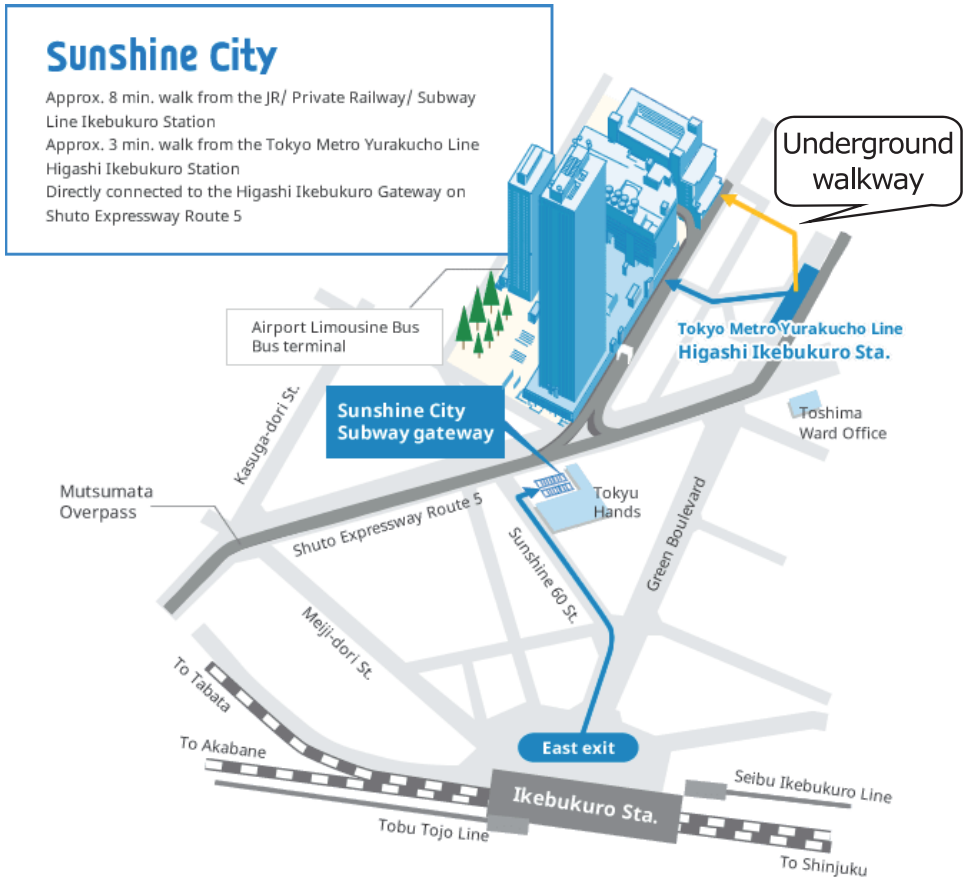
Getting back	1st	Last
Sunshine City	21:45	22:00
Ikebukuro Sta. East Exit	21:50	22:05
RIHGA Royal Hotel Tokyo	22:00	22:15
Nishi-Waseda Sta.	22:10	22:25
Higashi-Shinjuku Sta.	22:15	22:30
Seibu-Shinjuku Sta.	22:20	22:35
Shinjuku Sta. West Exit	22:25	22:40
Shinjuku-Sanchome Sta.	22:35	22:50

(The schedule for bus operations may change depending on traffic conditions)

Basic phrases you may use to reach the banquet venue by yourself (you can use this page to ask the way)

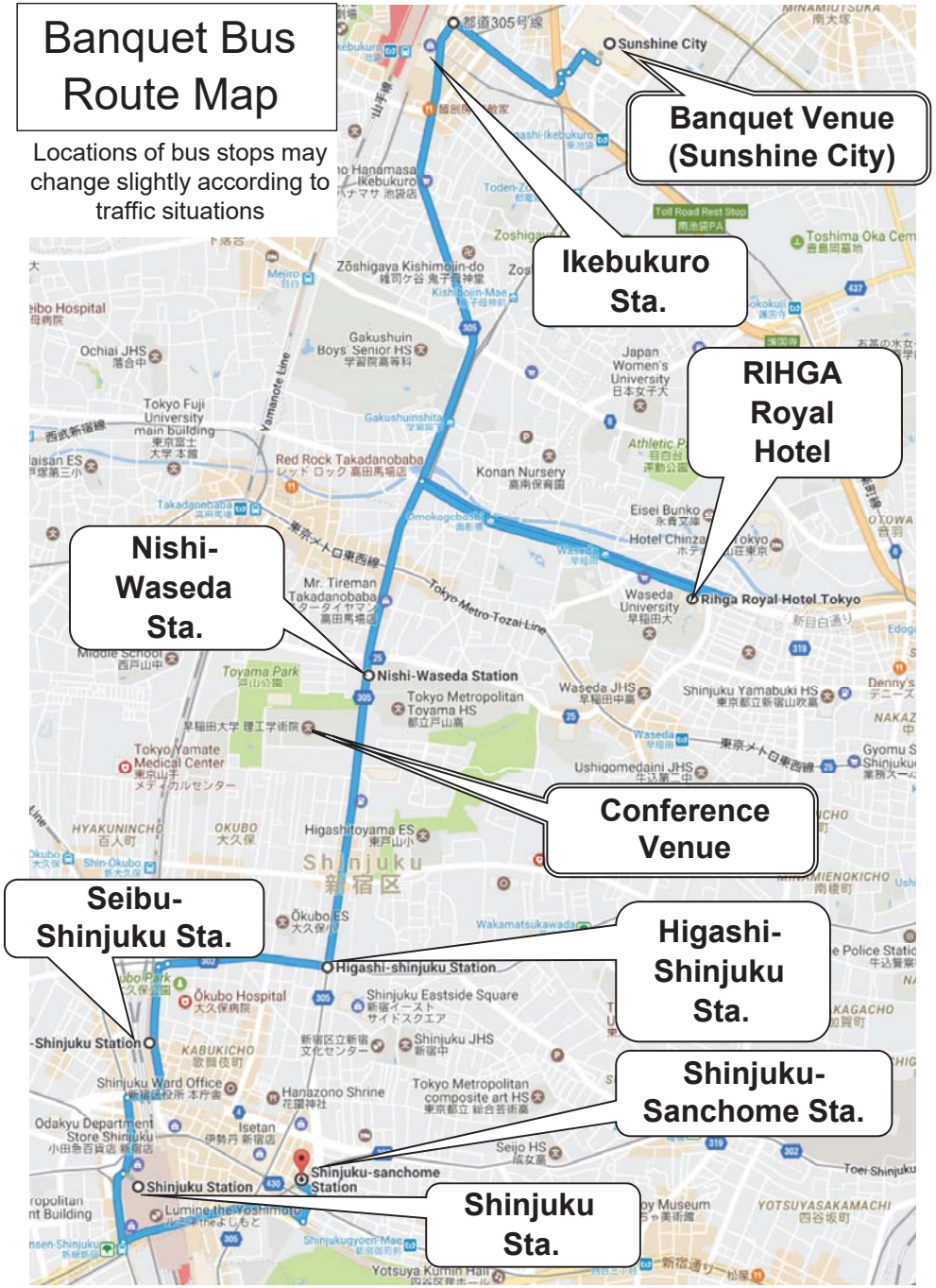
- En) Where is Sunshine city?
  Jp) サンシャインシティはどこですか？
  (Sunshine city wa dokodesuka ?)
- En) Where is Sunshine Cruise Cruise?
  Jp) サンシャインクルーズクルーズはどこですか？
  (Sunshine Cruise Cruise wa dokodesuka ?)
- En) Take me to Sunshine city, please.
  Jp)サンシャインシティまでお願いします。
  (Sunshine city made onegai shimasu)

Directions to Sunshine City where Sunshine 60 and SUNSHINE CRUISE CRUISE are located



Banquet Bus Route Map

Locations of bus stops may change slightly according to traffic situations



8th IEEE International Workshop on Empirical Software Engineering in Practice

13-17 March 2017
Waseda University, Tokyo, Japan

Conference Program

Message from the IEEE IWESEP 2017 Chairs

It is our great pleasure to welcome everyone to the 8th IEEE International Workshop on Empirical Software Engineering in Practice (IWESEP 2017). Our workshop aims to foster the development of the area by providing a forum where researchers and practitioners can report on and discuss new research results and applications in the area of empirical software engineering. The workshop encourages the exchange of ideas within the international community to better understand, from an empirical viewpoint, the strengths and weaknesses of technology in use and new technologies, with the expectation of furthering the field of software engineering. The workshop focuses on the processes, design and structure of empirical studies as well as the results of specific studies. The workshop welcomes both original and replicated studies, varying from controlled experiments to field studies, from quantitative to qualitative.

Since much of the data produced by software development is unstructured and complex, empirical software engineering research should evolve by integrating the state-of-the art techniques and theories for analyzing such data.

We solicited the following two types of submissions: full research papers (max 6 pages) for oral presentations and abstracts (max 700 words) for poster presentations. IWESEP 2017 received 18 research paper submissions. Papers covered a variety of topics, including developer support, automated program repair, machine learning, empirical analyses, and mining software repositories. All submissions went through a rigorous reviewing process in which every valid submission was reviewed by at least three program committee members, and an open electronic discussion was held for all the reviewed papers. Only 10 of the submitted papers were accepted. Accepted research papers will be published in the conference proceedings with an IEEE catalog number and ISBN number. The proceedings will be submitted to IEEE Xplore for publication. One of these papers received the best paper award.

On behalf of the program and organizing committees, we thank the authors and attendees for making IWESEP 2017 such an interactive event. We hope you will have a productive and engaging experience at IWESEP 2017.

Finally, the workshop would not be possible either without the generous supports from the following sponsors, to which we are very honored and grateful:

The IEEE;
The IEEE Computer Society;
The Association of Software Test Engineering (ASTER);
The Global Software Engineering Laboratory, Waseda University;
Program for Advancing Strategic International Networks to Accelerate the Circulation of Talented Researchers: Interdisciplinary Global Networks for Accelerating Theory and Practice in Software Ecosystem.

We hope you will have a great time and an unforgettable experience at IWESEP 2017.

Eunjong Choi, Nara Institute of Science and Technology, Japan
IWESEP 2017 General Chair

Masao Ohira, Wakayama University, Japan
Jaechang Nam, University of Waterloo, Canada
IWESEP 2017 Program Co-chairs

IWESEP 2017 Conference Organization

General Chair
Eunjong Choi, Nara Institute of Science and Technology, Japan

Program Co-Chairs
Jaechang Nam, University of Waterloo, Canada
Masao Ohira, Wakayama University, Japan

Publication Chair
Sousuke Amasaki, Okayama Prefectural University, Japan

Registration Co-Chairs
Patanamon Thongtanunam, Nara Institute of Science and Technology, Japan
Xin Yang, Osaka University, Japan

Local Arrangement Co-Chairs
Kiyoshi Honda, Waseda University, Japan
Erina Makihara, Nara Institute of Science and Technology, Japan
Hideshi Sakaguchi, Nara Institute of Science and Technology, Japan

Finance Co-Chairs
Akinori Ihara, Nara Institute of Science and Technology, Japan
Norihito Kitagawa, Nara Institute of Science and Technology, Japan
Kyohei Uemura, Nara Institute of Science and Technology, Japan

Web Co-Chairs
Natthawute Sae-Lim, Tokyo Institute of Technology, Japan
Chakkrit Tantithamthavorn, Nara Institute of Science and Technology, Japan

Social Networking Chair
Kazuhiro Yamashita, Kyushu University, Japan

Student Staff Chair
Yuhao Wu, Osaka University, Japan

Publicity Co-Chairs
Eun-Hye Choi, National Institute of Advanced Industrial Science and Technology, Japan
Daniel Alencar da Costa, Federal University of Rio Grande do Norte, Brazil
Shinpei Hayashi, Tokyo Institute of Technology, Japan
Andrea Mocci, University of Lugano, Switzerland

Steering Committee
Raula Gaikovina Kula, Osaka University, Japan
Hideaki Hata, Nara Institute of Science and Technology, Japan
Akinori Ihara, Nara Institute of Science and Technology, Japan
Yasutaka Kamei, Kyushu University, Japan
Shinsuke Matsumoto, Osaka University, Japan
Masateru Tsunoda, Kinki University, Japan

Advisory Committee
Katsuro Inoue, Osaka University, Japan
Shinji Kusumoto, Osaka University, Japan
Kenichi Matsumoto, Nara Institute of Science and Technology, Japan

IWESEP 2017 Program Committee

Bram Adams, MCIS, Ecole Polytechnique de Montreal, Canada
Olga Baysal, Carleton University, Canada
Cor-Paul Bezemer, Queen's University, Canada
Bogdan Dit, Boise State University, USA
Daniel German, University of Victoria, Canada
Shinpei Hayashi, Tokyo Institute of Technology, Japan
Steffen Herbold, University of Göttingen, Germany
Yoshiki Higo, Osaka University, Japan
Shin Hong, Handong University, South Korea
Akinori Ihara, Nara Institute of Science and Technology, Japan
Zhen Ming Jiang, York University, Canada
Yasutaka Kamei, Kyushu University, Japan
Foutse Khomh, Ecole Polytechnique de Montreal, Canada
Yepang Liu, Hong Kong University of Science and Technology, Hong Kong
David Lo, Singapore Management University, Singapore
Shane McIntosh, McGill University, Canada
Osamu Mizuno, Kyoto Institute of Technology, Japan
Andrea Mocci, University of Lugano, Switzerland
Weiyi Shang, Concordia University, Canada
Patanamon Thongtanunam, Nara Institute of Science and Technology, Japan
Aiko Yamashita, CWI, Netherlands & Oslo and Akershus University College, Norway
Thomas Zimmermann, Microsoft Research, USA

IWESEP 2017 Additional Reviewers

Seyed Amirhossein Abtahizadeh
Xuan-Bach D. Le
Ferdian Thung
Kazuhiro Yamashita
Yun Zhang

IWESEP 2017 Conference Program

Mon. March 13

	Room 202
8:00 -	**Registration**
9:20 - 9:30	Opening
9:30 - 10:30	**Keynote** Leveraging Machine Learning to Guide Software Evolution *Dr. Leon Moonen*
10:30 - 11:00	**Coffee Break**
11:00 - 12:00	**Session 1: Detection Techniques** Log-based Anomaly Detection of CPS Using a Statistical Method *Yoshiyuki Harada, Yoriyuki Yamagata, Osamu Mizuno and Eun-Hye Choi* Defect Analysis and Prediction by Applying the Multistage Software Reliability Growth Model *Jieming Chi, Kiyoshi Honda, Hironori Washizaki, Yoshiaki Fukazawa, Kazuki Munakata, Sumie Morita, Tadahiro Uehara and Rieko Yamamoto* An Empirical Evaluation of Detecting Omissions by Comparing Words between Requirement and Architectural Documents *Takehiro Wakabayashi, Shuji Morisaki, Noritoshi Atsumi and Shuichiro Yamamoto*
12:00 - 12:10	Discussion
12:10 - 12:30	Lightning talk for Posters
12:30 - 14:00	**Poster Session & Lunch**
14:00 - 15:20	**Session 2: Guiding Software Development** Analysis of Donations in Eclipse Project *Keitaro Nakasai, Hideaki Hata, Saya Onoue and Kenichi Matsumoto* Investigating Tendencies in Callback Method Implementations in Android Applications *Hayato Usui, Masataka Nagura and Shingo Takada* A Health Index of Open Source Projects Focusing on Pareto Distribution of Developer's Contribution *Hirohisa Aman, Aji Ery Burhandenny, Sousuke Amasaki, Tomoyuki Yokogawa and Minoru Kawahara* An Empirical Study of Effort-Size and Effort-Time Expert-Based Estimations *Habibi Husain Arifin, Jirapun Daengdej, Nguyen Thien Khanh*
15:20 - 15:30	Discussion
15:30 - 16:00	**Coffee Break**
16:00 - 17:00	**Session 3: Software Analysis** Should Function Point Elements be Used to Build Prediction Models? Kohei Yoshigami, Masateru Tsunoda, Yuto Yamada and Shinji Kusumoto Evaluating Automated Program Repair Using Characteristics of Defects Haruki Yokoyama, Yoshiki Higo and Shinji Kusumoto Understanding Key Features of High-impact Bug Reports Md. Rejaul Karim, Akinori Ihara, Xin Yang, Hajimu Iida and Kenichi Matsumoto
17:00 - 17:10	Discussion
17:10 - 17:20	Voting
17:20 - 17:35	Closing

Fast Abstracts - Presented at the Lobby as Posters

Improved metrics with iterative text mining for questionnaire analysis
Yuki Noyori, Hironori Washizaki, Yasuhiro Watanabe, Kiyoshi Honda, Kentarou Ogawa and Hiroyuki Shibata

SOLIT MANTRA: Visualizing Popular Library Combinations based on Wisdom of the Crowd
Boris Todorov, Raula Gaikovina Kula, Takashi Ishio and Katsuro Inoue

Empirical Study of OSS Regarding the Relationships between Bug Fixing Time and Metrics
Masaki Hosono, Hironori Washizaki, Yoshiaki Fukazawa, Kiyoshi Honda, Kazuki Munakata, Sumie Morita and Yusuke Nemoto

An Evolutionary Study on The Popularity of Libraries in NPM JavaScript Package Ecosystem
Shi Qiu, Raula Gaikovina Kula and Katsuro Inoue

A Structural Analysis Method of OSS Community Evolution Based on Semantic Graph Models
Seiya Kato, Yota Inagaki and Mikio Aoyama

A Study of Fault-Prone Method Prediction with Distortions between Method's Name and its Implementation
Sho Suzuki, Hirohisa Aman and Minoru Kawahara

Development of a Real-Time 3D Java Profiler
Katsuya Ogami, Hideaki Hata and Kenichi Matsumoto

Monitoring and Visualizing Programming Behaviors by Novices Towards an Automated Programming Exercise
Erina Makihara, Hiroshi Igaki, Norihiro Yoshida, Kenji Fujiwara and Hajimu Iida

Customization Patterns for GQM Model: Optimization of Maintainability Metrics by Checklist Based Review and Machine Learning
Naohiko Tsuda, Hironori Washizaki, Yoshiaki Fukazawa, Shunsuke Sugimura, Yuichiro Yasuda and Masanao Futakami

How does gamification work for coding and reviewing?
Kohei Yoshigami, Taishi Hayashi, Masateru Tsunoda and Hidetake Uwano

Effect of signalling on recruiting software developers
Atsuyoshi Iba and Masateru Tsunoda

Toward Predicting A Reviewer Not to Ignore Code Review Requests in OSS Development
Kenichi Ono, Akinori Ihara and Kenichi Matsumoto

Keynote: Leveraging Machine Learning to Guide Software Evolution

Photo by Bård Gudim

Speaker
Leon Moonen, Simula Research Laboratory, Norway

Abstract
Knowledge about dependencies between system artifacts such as modules, methods and variables is essential for a variety of software maintenance and software evolution tasks. Unfortunately, existing approaches to uncover such dependencies by means of static or dynamic program analysis are typically language-specific. Their application is thus largely restricted to homogeneous systems, which is a major drawback given the increasingly heterogeneity in modern software systems.

In this talk, we will look at the alternative of using unsupervised machine learning techniques such as association rule mining, which can be used to infer knowledge about the relationships between items in a data set. Association rule mining has been successfully used to analyze the change history of a software system and uncover so called evolutionary coupling between its artifacts. One of the advantages of this approach is that it is language-agnostic, and uncovering dependencies across artifacts written in different programming languages essentially comes for free.

We will explore how association rule mining can be used to derive evidence-based recommendations to guide software maintenance and evolution tasks. Examples include software change impact analysis, recommending related change during development, and conducting targeted regression testing. We survey the state-of-the-art, analyze why and where the applicability of existing techniques falls short, and discuss several avenues for improvement, including novel mining algorithms, methods for aggregating the evidence captured by individual rules, and guidelines for selecting appropriate values for parameters of the mining algorithms.

Biography

Leon Moonen is a senior research scientist in the Software Engineering department at Simula Research Laboratory, Norway. His research aims at creating better techniques and tools to support the understanding, assessment and evolution of large industrial software systems. This work involves the combination of several fields, such as software analytics, program comprehension, software reverse engineering, software repository mining, machine learning and empirical software engineering. He likes to work in close collaboration with industry to ensure that his research addresses questions of practical value, and to evaluate candidate solutions in reallife circumstances. Current ongoing projects include recommendation systems to support smarter evolution and testing of safety-critical cyber-physical systems, software analytics for continuous software quality and maintainability assessments, methods for creating anti-fragile software systems, and high integrity software engineering.

Dr. Moonen has published over 100 scientific papers and serves on steering-, organizing-, and program committees of international conferences on software maintenance and evolution, reverse engineering, program understanding, and source code analysis. He has (co-)organized various workshops on topics related to these areas. He is co-founder of the Software Improvement Group, a company that specializes in the use of source code analysis to help organizations get control over their software systems. Dr Moonen received his MSc (cum laude, Computer Science, 1996) and PhD (Computer Science, 2002) from the University of Amsterdam. He is a member of ACM, IEEE Computer Society, EAPLS and the ERCIM Working Group on Software Evolution.

Notes