

DISEI
Dishui Lake
International Software
Engineering Institute

The 2nd International Symposium on Software Fault Prevention, Verification, and Validation

• SFPVV 2025 •

Shanghai·China

11·8-11·9

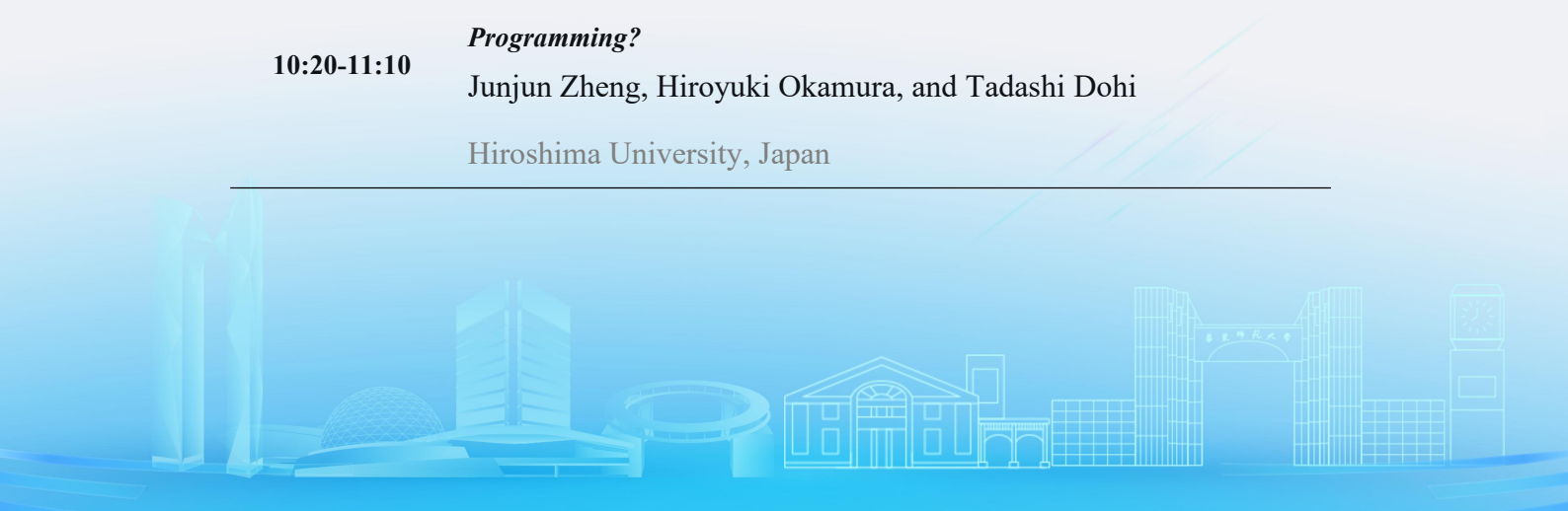


The 2nd International Symposium on Software Fault Prevention, Verification, and Validation

DAY 1, NOVEMBER 8TH

Room 407, DISEI Building

Time	Activities
09:00-09:10	Opening Remark
09:10-10:00	Keynote 1: Software Analysis Speaker: Jian Zhang Institute of Software, Chinese Academy of Sciences (ISCAS), China University of Chinese Academy of Sciences (UCAS), China Chair: Shaoying Liu East China Normal University, China
10:00-10:20 Coffee Break	
Session 1 Program Analysis Chair: Xiuqing Guo (The University of Osaka)	
10:20-11:10	<i>Can Generative AI Enhance the Effectiveness of N-Version Programming?</i> Junjun Zheng, Hiroyuki Okamura, and Tadashi Dohi Hiroshima University, Japan



QRAT: A Reachability Analysis Tool for Quantum Programs

Canh Minh Do and Kazuhiro Ogata

Japan Advanced Institute of Science and Technology, Japan

Session 2 Testing and Debugging (1)

Chair: Canh Minh Do

(Japan Advanced Institute of Science and Technology)

***An empirical study on Software Defect Prediction based on
neural network DeepDebugger technique***

Yuxiang Shang, Shaoying Liu, and Jin Song Dong

Hiroshima University, Japan

East China Normal University, China

National University of Singapore, Singapore

11:10-12:25

Fuzzing the Solidity Compiler Solc with Fuzz4All

Haruto Igaki and Tatsuhiko Tsuchiya

The University of Osaka, Japan

Diagnosing and Repairing Field Access Hallucinations in

LLM-Based Test Generation

Xiujing Guo and Tatsuhiko Tsuchiya

The University of Osaka, Japan

12:30-14:00 Lunch Break

Session 3: Analysis of AI Systems

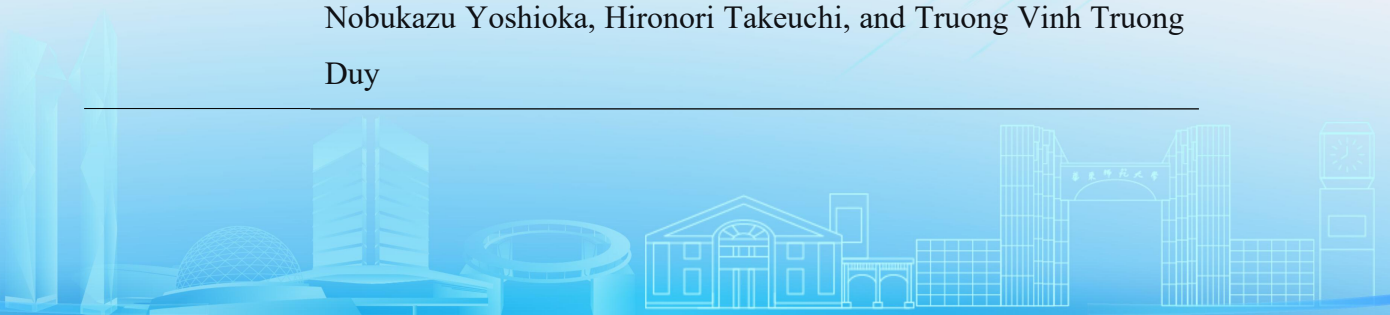
Chair: Junjun Zheng (Hiroshima University)

Data-driven and Scenario-based Risk Analysis Considering

14:00-15:15

Uncertainty in Machine Learning Systems

Toshiya Okubo, Hironori Washizaki, Naoyasu Ubayashi,
Nobukazu Yoshioka, Hironori Takeuchi, and Truong Vinh Truong
Duy



Waseda University, Japan

QAML Inc, Japan

Musashi University, Japan

Aisin Corporation, Japan

Similarity Evaluation between Queries and Chunks in RAG Systems

14:00-15:15

Shun Noguchi, Kozo Okano, Shipei Ogata, Shin Nakajima

Shinshu University, Japan

National Institute of Informatics, Japan

(Presentation track paper)

A Pass Orchestration Approach to Lowering Memory Footprints of Computation Graphs

Pengbo Nie

Shanghai Jiao Tong University, China

15:15-15:40 Coffee Break

Session 4 Formal Verification (1)

Chair: Weikai Miao (East China Normal University)

A Support Tool for Verification of Simulation Relations between State Machines with Maude

Takanori Ishibashi , Masaki Nakamura , and Kazuhiro Ogata

Japan Advanced Institute of Science and Technology (JAIST),

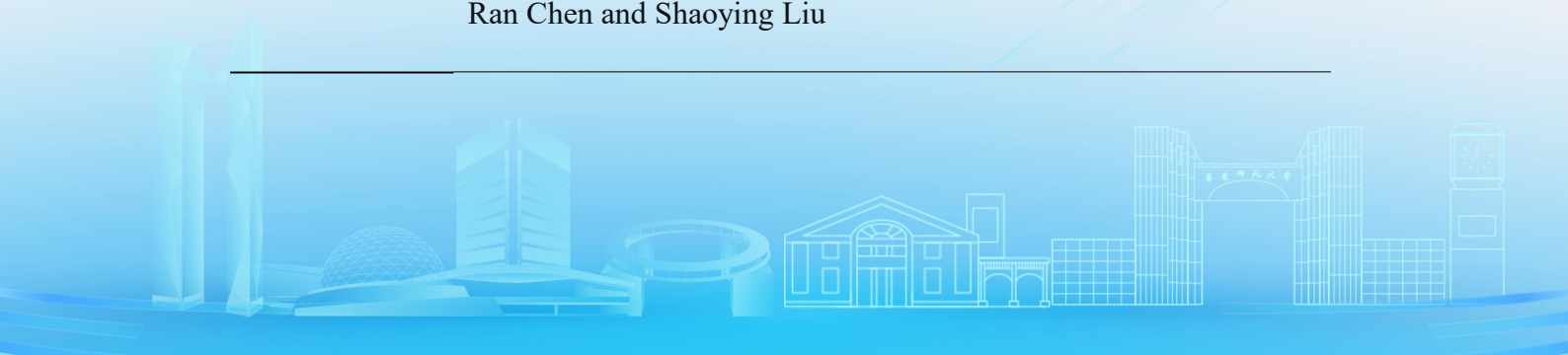
Japan

15:40-16:30

Toyama Prefectural University, Japan

Design and Implementation of a Software Tool to Support Agile-SOFL

Ran Chen and Shaoying Liu



East China Normal University, China

Hiroshima University, Japan

Session 5 Security

Chair: Jiandong Li (Peking University)

(Presentation track paper)

***Cross-Language Vulnerability Nets: Modeling and Detecting
Exploits Across Language Boundaries***

Pingyan Wang, Xiaoyuan Jing

Guangdong University of Petrochemical Technology, China

16:30-17:20

(Presentation track paper)

A Data-centric Approach to Java Confidential Computing

Xinyuan Miao

Shanghai Jiao Tong University, China

18:00 Banquet

DAY 2, NOVEMBER 9TH

Room 407, DISEI Building

Time	Activities
09:10-10:00	Keynote 2: Impact of IEEE Computer Society in Advancing Technologies, including AI SE based on Modeling with Patterns and MLOps Speaker: Hironori Washizaki Waseda University, Japan President of the 2025 IEEE Computer Society (CS) Chair: Tadashi Dohi Hiroshima University, Japan



10:00-10:20 Coffee Break

Session 6 Formal Verification (2)

Chair: Ai Liu (Nanjing University of Aeronautics and Astronautics)

10:20-11:10

Model Checking the Two-Phase Commit Protocol for Distributed Database Systems

Yisong Yu, Naipeng Dong, Jun Pang, and Jin Song Dong

National University of Singapore, Singapore

The University of Queensland, Australia

University of Luxembourg, Luxembourg

Formal Verification of Measurement-based Quantum Computation in Maude

Ryuichi Nagoshi and Tsubasa Takagi

Japan Advanced Institute of Science and Technology, Japan

Session 7 Specification

Chair: Jun Pang

(University of Luxembourg)

(Presentation track paper)

SBRDL: A System Behavioral Requirements Description

Language for Aerospace Embedded Control SoAware

Jiandong Li and Zhi Jin

11:10-12:25

Peking University, China

(Presentation track paper)

Type soundness for language-based security in Dafny

Chenyi Zhang

University of Canterbury, New Zealand



(Presentation track paper)

A Specification Theory of Real-Time Processes

Xu Wang

East China Normal University, China

12:30-14:00 Lunch Break

Session 8: Testing and Debugging (2)

Chair: Yuting Chen (Shanghai Jiao Tong University)

(Presentation track paper)

***Testing-Based Formal Verification on Functional Soundness
and Completeness with Automated Test Case Generation***

Ai Liu

Nanjing University of Aeronautics and Astronautics, China

(Presentation track paper)

14:00-15:15

***Towards Reliable MLIR: Adaptive Fuzzing and Lowering Space
Exploration***

Jingjing Liang

East China Normal University, China

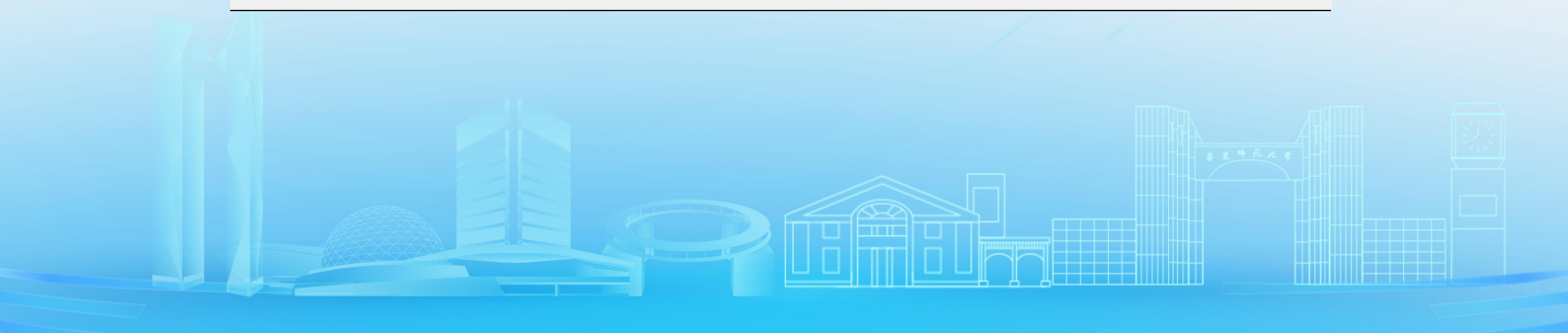
(Presentation track paper)

Optimizing input minimization in kernel fuzzing

Hui Guo

East China Normal University, China

CLOSING



KEYNOTES

Keynote 1: Software Analysis

Speaker: Jian Zhang is a research professor with the Institute of Software, Chinese Academy of Sciences (ISCAS), and an adjunct professor with the University of Chinese Academy of Sciences (UCAS). His research interests include software testing, program analysis, automated reasoning and constraint solving. He has served on the program committees of well-known international conferences such as ICSE, ISSTA, ISSRE, VSTTE, FM, ICFEM, IJCAR, CADE SAT and QSIQ/QRS. Currently, he serves on the editorial boards of several journals including Frontiers of Computer Science, Journal of Computer Science and Technology, and Chinese Journal of Computers. He has published several books, including Automatic Generation of Combinatorial Test Data (with Zhiqiang Zhang and Feifei Ma), Logic in Computer Science (with Hantao Zhang).



Abstract: Software analysis is an important class of techniques for preventing faults in software. In particular, various static program analysis methods are quite effective for identifying bugs before the software is deployed. This talk will give an overview of our works on the analysis of C/C++ programs and Android apps. Then I will discuss various issues such as benchmarking, false warning elimination, cross-language analysis, and the use of AI techniques in software analysis.



Keynote 2: Impact of IEEE Computer Society in Advancing Technologies, including AI SE based on Modeling with Patterns and MLOps



Speaker: Hironori Washizaki is the 2025 IEEE Computer Society (CS) president. He is a professor and the associate dean of the Research Promotion Division at Waseda University. He is a visiting professor at the National Institute of Informatics and an advisor at the University of Human Environments. He also works in the industry as an outside director and advisor at eXmotion and SI&C. He has led

professional and educational activities at the IEEE CS, including the evolution of the Guide to the Software Engineering Body of Knowledge (SWEBOK) and the CS Juniors program. He has led many academia-industry joint research and large-funded projects in systems and software requirements, design, reuse, quality assurance, and AI software engineering. He leads a professional IoT/AI/DX education project called “Smart SE.” Since 2015, he has been the convenor of ISO/IEC/JTC1/SC7/WG20 to standardize bodies of knowledge and certifications in systems and software engineering.

Abstract: This talk first provides an overview of IEEE Computer Society’s strategic areas, including engaging our members, engaging the industry, and leading new areas such as AI and Society. Then, the talk explains the latest version of the Technology Predictions 2025, which foresees 22 breakthrough technologies (incl. LLM/AI Agents) to shape the future of our world for decades to come, and the Guide to the Software Engineering Body of Knowledge (SWEBOK Guide) V4.0, which reflects the current state of generally accepted knowledge, including a new topic, AI and Software Engineering (SE). Then, as a part of AI and SE, the talk presents AI

software engineering, with a particular focus on a multi-view modeling framework and engineering patterns for Machine Learning and LLM systems (including design patterns and assurance argument patterns), with ML pipeline integration, to address multi-dimensional aspects and the probabilistic nature of ML/LLM, and its experimentative development approach involving ML training, performance monitoring, repair pipelines, and security risk management.



Welcome to Shanghai: A Guide for Conference Delegates

◆ Key Venue Information

1. **Main Conference Venue:** Room 407, DISEI Building (No. 111 Nanmu Rd., Pudong District, Shanghai)

2. **Wi-Fi Access:**

Primary Network: ECNU-1x

Access: Use your eduroam account. If you do not have an eduroam account, please ask our volunteers for a temporary account and password.

◆ Getting To & Around DISIE Building

The venue (Dishui Lake International Software Engineering Institute) is approximately 75 km from Shanghai city center. The following are your best transportation options:

1. From Shanghai Pudong International Airport (PVG):

(1) **Taxi:** Most convenient. The journey takes about 45-60 minutes and costs approximately RMB 180-220. Show the driver the Chinese address: 上海浦东新区临港新片区楠木路 111 号华东师范大学滴水湖国际软件学院（上海市滴水湖万枫酒店旁）.

(2) **Didi (Ride-hailing):** Use the Didi App (English interface available). Similar cost and time as a taxi.

(3) **Maglev + Metro:** A budget-friendly and fast option.

Take the Maglev Train from PVG to Longyang Road Station (7 mins).

Transfer to Metro Line 16 to its terminus, Dishui Lake Station (approx. 60 mins).

From Dishui Lake, take a short taxi ride (5-10 mins) to your final destination.



2. From Hongqiao International Airport (SHA) / Shanghai Hongqiao Railway Station:

(1) **Taxi/Didi:** Not recommended due to long distance and high cost (over 90 mins, ~RMB 350).

(2) **Metro:**

Take Line 2 to Longyang Road Station.

Transfer to Line 16 to Dishui Lake Station.

3. Getting Around Lin-gang:

Taxi/Didi: The most flexible way for short trips within Lin-gang.

Metro: Line 16 connects key areas. Dishui Lake Station is the main hub.

Walking/Cycling: The core area around Dishui Lake is very pedestrian and bike-friendly. Look for public bike-sharing stations.

4. Dining & Coffee Breaks

At the Conference Venue:

Lunch will be provided on the second floor of DISEI Building.

Coffee breaks will be provided on the fourth floor, directly outside the main conference room.

Banquet: there will be a banquet on Day 1, and a complimentary shuttle bus will be available departing from the DISEI Building.

Starbucks / Luckin Coffee - Familiar coffee chains.

5. Things to See & Do (During Your Free Time)

Dishui Lake (滴水湖): A massive, man-made lake perfect for a relaxing stroll, cycling, or boating. The conference venue is likely nearby.

Shanghai Astronomy Museum (上海天文馆): A world-class museum and a must-visit! **Booking in advance online is mandatory.** We recommend booking as soon as possible via their official WeChat account or website.



Harbor City Shopping Outlets (海港城): For some retail therapy.

Nanhui Beach (南汇嘴观海公园): A coastal park for viewing the East China Sea.

6. Essential Information & Emergency Contacts

Currency: Chinese Yuan (CNY or RMB). Major credit cards are accepted in hotels and some restaurants, but Alipay/WeChat Pay is ubiquitous. Have some cash as a backup.

Language: The local language is Mandarin. English is not widely spoken in Lin-gang. It is highly recommended to have your hotel's name and address written in Chinese on a card.

Time Zone: China Standard Time (CST), UTC+8.

Electricity: 220V, 50Hz. Power socket is Type I (some hotels may provide Type A).

A travel adapter is essential. Please check your device's voltage rating.

Emergency Contacts:

Police: 110

Fire & Ambulance: 119

Medical Emergency: 120



