

## DSA 2024 Session Schedule

All the sessions are based on the time in Beijing, China (UTC+8)

- Room A: 教学综合楼 C 座一楼 C100
- Room B: 教学综合楼 C 座六楼 C615
- Room C: 教学综合楼 C 座六楼 C616
- Room D: 教学综合楼 C 座七楼 C702
- Lunch: 西工大太仓校区第一食堂
- Conference Banquet: 珀丽酒店 (太仓上海东路 106 号)

<b>Saturday, November 2, 2024</b>		
08:15 – 09:00	Registration	综合楼 C 座一楼
09:00 – 09:15 (15 minutes)	<p><b>Opening Ceremony</b></p> <ul style="list-style-type: none"> <li>• Welcome Remarks                             <ul style="list-style-type: none"> <li>– Professor Xiaokui Yue (Northwestern Polytechnical University, China)</li> </ul> </li> <li>• Honorary General Chair                             <ul style="list-style-type: none"> <li>– Dr. Xiaoling Wang (Beijing Aerospace Automatic Control Institute, China)</li> </ul> </li> <li>• Steering Committee Chair                             <ul style="list-style-type: none"> <li>– Professor Eric Wong (University of Texas at Dallas, USA)</li> </ul> </li> <li>• General Chairs                             <ul style="list-style-type: none"> <li>– Professor Jiangbin Zheng (Northwestern Polytechnical University, China)</li> <li>– Professor Mohammad Zulkernine (Queen’s University, Canada) (<a href="#">Online/Zoom</a>)</li> </ul> </li> <li>• Program Chairs                             <ul style="list-style-type: none"> <li>– Professor Zhenyu Fang (Northwestern Polytechnical University, China)</li> <li>– Professor Hongji Yang (University of Leicester, UK) (<a href="#">Online/Zoom</a>)</li> <li>– Professor Junhua Ding (University of North Texas, USA) (<a href="#">Online/Zoom</a>)</li> </ul> </li> </ul>	Room A (C100)
09:15 – 10:05 (50 minutes)	<ul style="list-style-type: none"> <li>• <b>Keynote Speech I</b> (Host: W. Eric Wong)</li> </ul> <p style="text-align: center;"><i>Provenance-Based Security in Secure Dependable Systems</i></p> <p>Professor Ragib Hasan (<a href="#">Online/Zoom</a>) The University of Alabama at Birmingham, USA</p>	Room A (C100) Online/Zoom
10:05 – 10:30 (25 minutes)	<ul style="list-style-type: none"> <li>• <b>Group Picture &amp; Coffee Break</b></li> </ul>	综合楼 C 座一楼
10:30 – 11:20 (50 minutes)	<ul style="list-style-type: none"> <li>• <b>Keynote Speech II</b> (Host: Zhenyu Fang)</li> </ul> <p style="text-align: center;"><i>Software Fault Prevention and Verification in Human-Machine Pair Programming</i></p> <p>Professor Shaoying Liu Hiroshima University, Japan</p>	Room A (C100)
11:20 – 12:10 (50 minutes)	<ul style="list-style-type: none"> <li>• <b>Keynote Speech III</b> (Host: Yunwei Dong)</li> </ul> <p style="text-align: center;"><i>Program Analysis: Successes and Challenges</i></p> <p>Professor Jian Zhang Chinese Academy of Sciences, China</p>	Room A (C100)
12:10 – 13:30 (80 minutes)	<ul style="list-style-type: none"> <li>• Lunch</li> </ul>	西工大太仓 校区第一食堂

13:30 – 14:30 (60 minutes)	<ul style="list-style-type: none"> <li>• Session I-A: Artificial Intelligence and Machine Learning I (3 Papers)</li> <li>• Session I-B: Software Testing and Quality Assurance I (3 Papers)</li> </ul>	Room B (C615) Room C (C616)
14:30 – 15:30 (60 minutes)	<ul style="list-style-type: none"> <li>• Session II-A: Artificial Intelligence and Machine Learning II (4 Papers)</li> <li>• Session II-B: Software Testing and Quality Assurance II (3 Papers)</li> </ul>	Room B (C615) Room C (C616)
15:30 – 15:50 (20 minutes)	<ul style="list-style-type: none"> <li>• Coffee Break</li> </ul>	综合楼 C 座 六楼
15:50 – 17:30 (100 minutes)	<ul style="list-style-type: none"> <li>• Session III-A: Object Detection and Computer Vision (5 Papers)</li> <li>• Session III-B: Cybersecurity and Dependability (5 Papers)</li> </ul>	Room B (C615) Room C (C616)
17:30 – 18:30 (60 minutes)	<ul style="list-style-type: none"> <li>• Break</li> </ul>	
18:30 – 20:30	<ul style="list-style-type: none"> <li>• Conference Banquet</li> </ul>	珀丽酒店 一楼时光吧

<b>Sunday, November 3, 2024</b>		
08:30 – 09:00	Registration	综合楼 C 座 六楼
09:00 – 10:00 (60 minutes)	<ul style="list-style-type: none"> <li>• Session IV-A: Bug Detection and Threat Analysis (3 Papers)</li> <li>• Session IV-B: Reliability and Testing for Artificial Intelligence Systems I (3 Papers)</li> <li>• Session IV-C: Network Robustness and Optimization (3 Papers)</li> </ul>	Room B (C615) Room C (C616) Room D (C702)
10:00 – 11:00 (60 minutes)	<ul style="list-style-type: none"> <li>• Session V-A: Data Augmentation, Transmission, and Management (3 Papers)</li> <li>• Session V-B: Reliability and Testing for Artificial Intelligence Systems II (3 Papers)</li> <li>• Session V-C: Virtualization and System Optimization and Interoperation (4 Papers)</li> </ul>	Room B (C615) Room C (C616) Room D (C702)
11:00 – 11:20 (20 minutes)	<ul style="list-style-type: none"> <li>• Coffee Break</li> </ul>	综合楼 C 座 六楼
11:20 – 12:20 (60 minutes)	<ul style="list-style-type: none"> <li>• Session VI-A: Evaluation and Modeling (2 Papers)</li> <li>• Session VI-B: Machine Learning and Information Diffusion (3 Papers)</li> <li>• Session VI-C: Fast Abstracts (3 papers)</li> </ul>	Room B (C615) Room C (C616) Room D (C702)
12:20 – 13:30 (70 minutes)	<ul style="list-style-type: none"> <li>• Lunch</li> </ul>	西工大太仓 校区第一食堂
13:30	<ul style="list-style-type: none"> <li>• Adjourn</li> </ul>	

DSA 2024 Presentation Schedule  
All the sessions are based on the time in Beijing, China (UTC+8)

Saturday, November 2, 2024 (13:30 – 14:30) (60 minutes)

Session I-A: Artificial Intelligence and Machine Learning I (3 Papers)

Location: Room B (C615)

Chair: Qiangguo Jin

- R004-Pruning-Based Optimization of Model Distillation Algorithm Using Explainable Machine Learning Methods
- R061-Software Defect Prediction Model Based on Syntactic Semantics and Flow Information Features
- R064-Deep Learning Model Risk Identification and Control Technology

Saturday, November 2, 2024 (13:30 – 14:30) (60 minutes)

Session I-B: Software Testing and Quality Assurance I (3 Papers)

Location: Room C (C616)

Chair: Junbo Wang

- R051-MetBench: A Numerical Expression Metamorphic Relations Benchmark Data Set
- R068-Automated Structural Test Case Generation for Human-Computer Interaction Software based on Large Language Model
- R071-Semantic-Guided Adaptive Exploration Testing for GUI Software

Saturday, November 2, 2024 (14:30 – 15:30) (60 minutes)

Session II-A: Artificial Intelligence and Machine Learning II (4 Papers)

Location: Room B (C615)

Chair: Qiangguo Jin

- R066-Prediction of Carbon Emissions Based on PCA and Neural Network Models under the “Dual Carbon” Background
- R078-Metrics and Testing Methods for Artificial Intelligence Software Quality Models and Their Application Examples
- R090-Retrainable Hand Gesture Recognition Model Driven by Edge AI
- R089-Generative AI for Smart Contracts in Real Estate Business

Saturday, November 2, 2024 (14:30 – 15:30) (60 minutes)

Session II-B: Software Testing and Quality Assurance II (3 Papers)

Location: Room C (C616)

Chair: Junbo Wang

- R080-Prioritization of Crowdsourced Test Reports Based on Defect Severity and Frequency Weighting
- R095-Analysis and Comparison of Mutation Testing Tools for Python
- IT001-Coverage-Guided Testing for Automatic Speech Recognition Systems

Saturday, November 2, 2024 (15:50 – 17:30) (100 minutes)

Session III-A: Object Detection and Computer Vision (5 Papers)

Location: Room B (C615)

Chair: Qiangguo Jin

- R022-Infrared Object Detection Based YOLOv8s from UAV Images
- R032-YOLOv8s-D2: A Novel Object Defect Detection Algorithm Based on Improved YOLOv8s
- R074-YOLO-Based Component Detection System for Electrical Diagrams
- R031-StyleEditorGAN: Transformer-based Image Inversion and Realistic Facial Editing
- S001-Research on 3D Visualization of Human Body Actions

Saturday, November 2, 2024 (15:50 – 17:30) (100 minutes)

Session III-B: Cybersecurity and Dependability (5 Papers)

Location: Room C (C616)

Chair: Junbo Wang

- R027-An Efficient Task Scheduling for Security and Stability Control System Models on Multi-Core Systems
- R043-Interplay of Attacker Behaviors and Dependability Attributes in Industrial Control System Impact Analysis
- R054-Functional Safety Evaluation for Cybersecurity Measures in Low-End Automotive Control Units
- S006-Enhancing Dependability of Industrial Robots: Security and Safety Assessments Based-on Model-Driven Engineering
- R016-Detection and Estimation of False Data Injection Attacks by Unmanned Surface Vessels

Sunday, November 3, 2024 (09:00 – 10:00) (60 minutes)

Session IV-A: Bug Detection and Threat Analysis (3 Papers)

Location: Room B (C615)

Chair: Zhenyu Fang

- R076-Enhancing the Detection of Anomalous Artifact Operations in Temporal Structured Workflows
- R082-HYDBre: A Hybrid Retrieval Method for Detecting Duplicate Software Bug Reports
- R070-Threat Assessment of Formation Based on Intention Classification and Entropy-Topsis Method

Sunday, November 3, 2024 (09:00 – 10:00) (60 minutes)

Session IV-B: Reliability and Testing for Artificial Intelligence Systems I (3 Papers)

Location: Room C (C616)

Chair: Lipeng Gao

- RTAIS001-A Hybrid Malicious Node Detection Approach Based on Fuzzy Trust Model and Bayesian Belief in Wireless Sensor Networks
- RTAIS002-Semantic-Weighted Word Error Rate Based on BERT for Evaluating Automatic Speech Recognition Models
- RTAIS003-A Time-Aware Recommendation Model with Social Impact

Sunday, November 3, 2024 (09:00 – 10:00) (60 minutes)

Session IV-C: Network Robustness and Optimization (3 Papers)

Location: Room D (C702)

Chair: Junbo Wang

- R026-Robustness-Aware SFC Placement in NFV-enabled Multi-domain Networks Under Resource Demand Uncertainty
- R055-Planning Model of Air Defense Kill Webs Based on Genetic Algorithm
- R059-A Reliable Extrapolative Capacity Estimation Method for Complex Distributed Web Services

Sunday, November 3, 2024 (10:00 – 11:00) (60 minutes)

Session V-A: Data Augmentation, Transmission, and Management (3 Papers)

Location: Room B (C615)

Chair: Zhenyu Fang

- R081-Research on Data Augmentation Methods for Small Sample Image Datasets
- R063-Research on Methods for Presenting Battlefield Situation Hotspots
- R065-Design of Individual Soldier Multimedia Command and Control System Based on Ad Hoc Wireless Mesh Network

Sunday, November 3, 2024 (10:00 – 11:00) (60 minutes)

Session V-B: Reliability and Testing for Artificial Intelligence Systems II (3 Papers)

Location: Room C (C616)

Chair: Lipeng Gao

- RTAIS004-A Vulnerability Propagation Impact Analysis Approach Based on Code Semantics with LLM
- RTAIS005-A Survey of Mutation Based Testing Adequacy Study on Smart Contract
- RTAIS006-Survey on Simulation Testing of Autonomous Driving System

Sunday, November 3, 2024 (10:00 – 11:00) (60 minutes)

Session V-C: Virtualization and System Optimization and Interoperation (4 Papers)

Location: Room D (C702)

Chair: Junbo Wang

- R073-A Virtual Texture Technology Realized on Low Computational Power Platforms
- R091-Virtualized TCP/IP Protocol Stack Based on VxWorks
- R092-Container Design Based on VxWorks
- R062-Analysis on Individual Manned and Unmanned Cooperation Interoperable Computing

Sunday, November 3, 2024 (11:20 – 12:20) (60 minutes)

Session VI-A: Evaluation and Modeling (2 Papers)

Location: Room B (C615)

Chair: Zhenyu Fang

- R067-A Survey of Comprehensive Evaluation Methods
- R087-A Quantitative Evaluation Approach for Online Review Quality Based on the AHP-Fuzzy Comprehensive Evaluation

Sunday, November 3, 2024 (11:20 – 12:20) (60 minutes)

Session VI-B: Machine Learning and Information Diffusion (3 Papers)

Location: Room C (C616)

Chair: Lipeng Gao

- R085-Fin-MLGAT: Line Graph Attention Network for Dialogue Emotion Recognition in Stock Market and Its Evaluations
- R086-WVRF\_CGT: WVRF Automatic Filter Based Cascading Graph Transformer for Information Diffusion in Stock Q&A Platform
- FA003-Digital Transformation of Security Standards: Requirements Extraction using Large Language Models

Sunday, November 3, 2024 (11:20 – 12:20) (60 minutes)

Session VI-C: Fast Abstract (3 Papers)

Location: Room D (C702)

Chair: Junbo Wang

- FA001-Distributed Spectrum Sensing Structure Design Based on Distributed Deep Neural Network
- FA002-AI-Assisted Bug Detection in Open-Source Software
- FA004-Autonomous Driving Software Testing Based on Interpretation Analysis



Dr. Ragib Hasan  
Professor & Director of Center for Cyber Security  
The University of Alabama at Birmingham, USA

### **Abstract**

Provenance, which meticulously documents the history and interactions of objects, has seen extensive application in both scientific and security domains in recent years. This presentation will delve into how the concept of secure provenance can significantly enhance the dependability and robustness of systems and applications. By leveraging secure provenance, we can develop universal and adaptable authentication and access control mechanisms that are both flexible and resilient. The application of provenance in security offers numerous practical advantages, including the ability to integrate real-world trust concepts and adapt to various scenarios. Furthermore, we will demonstrate how interactions between different systems and users can serve as fundamental elements in security strategies, with wide-ranging implications for the development of dependable systems. These interactions not only enhance security but also contribute to the overall reliability and trustworthiness of the systems in question.

### **Bio**

Dr. Ragib Hasan is a tenured Full Professor in the Department of Computer Science at the University of Alabama at Birmingham (UAB). He also serves as the Director of the UAB Center for Cyber Security, where he leads initiatives in cybersecurity research, education, and outreach. His research interests encompass cloud security, IoT security, autonomous vehicle security, and smart cities. Dr. Hasan joined UAB in 2011, following the completion of his Ph.D. and M.S. in Computer Science from the University of Illinois at Urbana-Champaign in October 2009 and December 2005, respectively. He also completed a postdoctoral fellowship as an NSF/CRA Computing Innovation Fellow at the Department of Computer Science, Johns Hopkins University. He is the founder of the Secure and Trustworthy Computing Lab (SECRETLab) at UAB. Additionally, he is a fellow at the UAB Sparkman Center for Public Health. Dr. Hasan has authored over 140 peer-reviewed articles in leading journals and conferences. His research has received support from the National Science Foundation (NSF), the National Institutes of Health (NIH), the Department of Homeland Security (DHS), the Office of Naval Research (ONR), Facebook Inc., Google Inc., and Amazon Inc. In 2014, he was awarded the prestigious NSF CAREER Award for his work on cloud security. He is the Principal Investigator (PI) of multiple NSF grants and the Co-Principal Investigator (Co-PI) of an NIH grant. His research has been recognized with a best paper award, a best poster award, and a runner-up award for best demo at top IEEE conferences. He has also won multiple awards for his e-learning initiative for millions of rural students in South Asia.



Dr. Shaoying Liu  
IEEE Fellow, BCS Fellow, AAIA Fellow  
Professor of Software Engineering  
Hiroshima University, Japan

### **Abstract**

Human-Machine Pair Programming (HMPP) represents a groundbreaking software development paradigm, first introduced by the speaker in 2018. HMPP integrates the creative strengths of human algorithm design with the machine's capabilities in fault prevention during development and rigorous verification after completion. This talk will explore the core principles of HMPP, focusing on the most pressing challenges: effective and efficient fault prevention during programming and the automation of program verification. I will delve into various fault prevention strategies and introduce the Testing-Based Formal Verification (TBFV) method as a key approach for ensuring program correctness. The talk will conclude by highlighting promising avenues for future research in this evolving field.

### **Bio**

Shaoying Liu is a Professor of Software Engineering at Hiroshima University, Japan, IEEE Fellow, BCS Fellow, and AAIA Fellow. He received the Ph.D. in Computer Science from the University of Manchester, U.K in 1992, and has experienced working at 9 universities in China, the U.K., and Japan. His research interests include Formal Engineering Methods, Specification-based Program Inspection and Testing, Testing-Based Formal Verification (TBFV), Human-Machine Pair Programming (HMPP), and Dependable Computing. Liu is a pioneer and leading researcher in Formal Engineering Methods for Software Development. He founded the ICFEM conference in 1997 and SOFL+MVSL workshop in 2012, respectively. He designed the SOFL (Structured Object-Oriented Formal Language) specification language and method, authored two books entitled "Formal Engineering for Industrial Software Development" and "Agile-SOFL: Agile Formal Engineering Method", respectively, both published by Springer, more than 13 edited books, and over 300 papers in refereed journals and international conferences. He has received many awards, including 2020 and 2022 Distinguished Research Awards from IPSJ/SIGSE respectively, the "20 Year ICFEM Impact Award" from ICFEM 2018, "IEEE Reliability Society Japan Joint Chapter 2016 Best Paper Award", and "Outstanding Paper Award" from ICECCS'96. In recent years, he has served as the General Chair of several international conferences, including ICFEM 2024 and ICECCS 2022.



Professor  
Institute of Software  
Chinese Academy of Sciences, China

### **Abstract**

Program analysis is an important class of techniques which are very helpful in developing dependable software systems. In particular, static program analysis tries to infer properties of the program without executing it. In this century, static program analysis tools are being used by more and more people. They helped developers and test engineers find intricate bugs successfully. Yet there are still some problems with such tools, such as scalability, efficiency and accuracy. In this talk, I will describe some techniques for static program analysis, in particular, our work on symbolic execution of C/C++ programs, and some of our recent attempts on using LLMs for static analysis tool development.

### **Bio**

Jian Zhang is a research professor with the Institute of Software, Chinese Academy of Sciences (ISCAS), and a 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, ICFEM and QSIC/QRS. He also serves on the editorial boards of several journals including Frontiers of Computer Science, Journal of Computer Science and Technology, and Chinese Journal of Computers.