

Message from the ICSE 2025 Program Chairs

Welcome to ICSE 2025! It is our pleasure to introduce the program of the 47th IEEE/ACM International Conference on Software Engineering (ICSE 2025), to be held in Ottawa, Ontario, Canada, from April 27 to May 3, 2025 (main conference days being April 30 – May 2). ICSE 2025 marks the 50th anniversary of ICSE, which was first held in 1975! ICSE provides a forum where researchers, practitioners, and educators gather to present and discuss research results, innovations, trends, experiences, and issues in the field of software engineering. ICSE covers all topics in software engineering, with the following research areas for 2025: AI for Software Engineering, Analytics, Architecture and Design, Dependability and Security, Evolution, Human and Social Aspects, Requirements and Modeling, Software Engineering for AI, and Testing and Analysis.

The Main Research Track of ICSE 2025 accepted **245** papers out of **1,150** papers submitted in two cycles (508 submissions in Cycle 1 and 642 submissions in Cycle 2, excluding desk rejections and early withdrawals); each paper underwent a thorough review process (with or without major revisions) and was reviewed by at least three members of the program committee.

Keynotes. This year’s program includes **three outstanding keynotes** given by: David Lorge Parnas, on *Regulation of AI and Other Untrustworthy Software*, Neha Rungta, on *Engineering Correctness for a Domain*, and Patricia Lago, on *Software Sustainability and Its Engineering: How Far Have We Come?*. We look forward to their keynotes!

Committees. We would like to thank the **Area Chairs**, who helped us ensure that submissions belonging to a given research area are rigorously and fairly reviewed. The Area Chairs also helped select the SIGSOFT Distinguished Paper Awards and the Distinguished Reviewer Awards. This year’s chairs for each area were as follows:

1. *AI for Software Engineering*: Christian Bird, Lin Tan, and Xin Xia
2. *Analytics*: Tegawendé F. Bissyandé, and Sarah Nadi
3. *Architecture and Design + Requirements and Modeling*: Yuanfang Cai
4. *Dependability and Security*: Raffaella Mirandola
5. *Evolution*: Xin Peng
6. *Human and Social Aspects*: Alexander Serebrenik
7. *Software Engineering for AI*: Yuriy Brun and Wei Le
8. *Testing and Analysis*: Gordon Fraser, Lars Grunske, and Sarfraz Khurshid.

We would like to thank the **Program Committee (PC)**, composed of **331** members, who did an incredible job in providing timely and constructive reviews, for the two review cycles (each allowing major revisions) and in participating in the online discussions.

Special thanks go to our three **Review Process Chairs**: Rory Lipkis, who helped us identify AI-generated papers and reviews, and Alex Potanin and Bowen Xu, who helped streamline the review process. The latter was achieved by automatically creating a manageable number of initial review bids for each PC member while ensuring that each paper, including those on less popular topics, received sufficient bids. The Toronto Paper Matching System was used to identify papers that match a particular PC member’s expertise. To evaluate the new process, we have sought feedback from PC members multiple times and allowed PC members to customize or even turn off the automated bid creation in Cycle 2. We have received a lot of positive feedback, and almost all reviewers have chosen to use it in Cycle 2.

This year, we also had a **Shadow PC** (with 50 members), meant to educate young reviewers and run by Domenico Bianculli and Patanamon Thongtanunam. Matt Dwyer served as the training chair, providing a training session to all Shadow PC members. We thank them for their laudable effort!

Awards. From the accepted papers, we have selected **23** outstanding papers to receive the SIGSOFT Distinguished Paper Award (awarded to less than 10% of the accepted papers). These papers are as follows (in no particular order):

1. *Understanding the Response to Open-Source Dependency Abandonment in the npm Ecosystem*. Courtney Miller, Mahmoud Jahanshahi, Audris Mockus and Christian Kästner.
2. *PairSmell: A Novel Perspective Inspecting Software Modular Structure*. Chenxing Zhong, Daniel Feitosa, Paris Avgeriou, Huang Huang, Yue Li, and He Zhang.
3. *Search-Based LLMs for Code Optimization*. Shuzheng Gao, Cuiyun Gao, Wenchao Gu, and Michael Lyu.
4. *Enhancing The Open Network: Definition and Automated Detection of Smart Contract Defects*. Hao Song, Teng Li, Jiachi Chen, Ting Chen, Beibei Li, Zhangyan Lin, Pan Li, and Xihan Zhou.
5. *Does GenAI Make Usability Testing Obsolete?* Ali Ebrahimi Pourasad and Walid Maalej.
6. *A Test Oracle for Reinforcement Learning Software based on Lyapunov Stability Control Theory*. Shiyu Zhang, Haoyang Song, Qixin Wang, Henghua Shen, and Yu Pei.
7. *Exploring the Robustness of the Effect of EVO on Intention Valuation through Replication*. Yesugen Baatartogtokh, Kaitlyn Cook, and Alicia M. Grubb.
8. *Unseen Horizons: Unveiling the Real Capability of LLM Code Generation Beyond the Familiar*. Yuanliang Zhang, Yifan Xie, Shanshan Li, Ke Liu, Chong Wang, Zhouyang Jia, Xiangbing Huang, Jie Song, Chaopeng Luo, Zhizheng Zheng, Rulin Xu, Yitong Liu, Si Zheng, and Xiangke Liao.
9. *Demystifying and Detecting Cryptographic Defects in Ethereum Smart Contracts*. Jiashuo Zhang, Yiming Shen, Jiachi Chen, Jianzhong Su, Yanlin Wang, Ting Chen, Jianbo Gao, and Zhong Chen.

10. *Thanos: DBMS Bug Detection via Storage Engine Rotation Based Differential Testing.* Ying Fu, Zhiyong Wu, Yuanliang Zhang, Jie Liang, Jingzhou Fu, Yu Jiang, Shanshan Li, Xiangke Liao.
11. *Tumbling Down the Rabbit Hole: How do Assisting Exploration Strategies Facilitate Grey-box Fuzzing?* Mingyuan Wu, Jiahong Xiang, Kunqiu Chen, Peng Di, Shin Hwei Tan, Heming Cui, and Yuqun Zhang.
12. *Towards Neural Synthesis for SMT-assisted Proof-Oriented Programming.* Saikat Chakraborty, Gabriel Ebner, Siddharth Bhat, Sarah Fakhoury, Sakina Fatima, Shuvendu Lahiri, and Nikhil Swamy.
13. *The Seeds of the FUTURE Sprout from History: Fuzzing for Unveiling Vulnerabilities in Prospective Deep-Learning Libraries.* Zhiyuan Li, Jingzheng Wu, Xiang Ling, Tianyue Luo, Zhiqing Rui, and Yanjun Wu.
14. *Interactive Cross-Language Pointer Analysis for Resolving Native Code in Java Programs.* Chenxi Zhang, Yufei Liang, Tian Tan, Chang Xu, Shuangxiang Kan, Yulei Sui, and Yue Li.
15. *Increasing the Effectiveness of Automatically Generated Tests by Improving Class Observability.* Geraldine Galindo-Gutierrez, Juan Pablo Sandoval Alcocer, Nicolas Jimenez-Fuentes, Alexandre Bergel, and Gordon Fraser.
16. *Iterative Generation of Adversarial Example for Deep Code Models.* Li Huang, Weifeng Sun, and Meng Yan.
17. *SeeAction: Towards Reverse Engineering How-What-Where of HCI Actions from Screenshots for UI Automation.* Dehai Zhao, Zhenchang Xing, Qinghua Lu, Sherry Xiwei Xu, and Liming Zhu.
18. *Automated Generation of Accessibility Test Reports from Recorded User Transcripts.* Syed Fatiul Huq, Mahan Tafreshipour, Kate Kalcevich, and Sam Malek.
19. *Early Detection of Performance Regressions by Bridging Local Performance Data and Architectural Models.* Lizhi Liao, Simon Eismann, Heng Li, Cor-Paul Bezemer, Diego Elias Costa, André van Hoorn, and Weiyi Shang.
20. *Unveiling the Energy Vampires: A Methodology for Debugging Software Energy Consumption.* Enrique Barba Roque, Luís Cruz, and Thomas Durieux.
21. *Hetrify: Efficient Verification of Heterogeneous Programs on RISC-V.* Yiwei Li, Liangze Yin, Wei Dong, Jiaxin Liu, Yanfeng Hu, and Shanshan Li.
22. *Formally Verified Cloud-Scale Authorization.* Aleks Chakarov, Jaco Geldenhuys, Matthew Heck, Michael Hicks, Samuel Huang, Georges-Axel Jaloyan, Anjali Joshi, K. Rustan M. Leino, Mikael Mayer, Sean McLaughlin, Akhilesh Mritunjai, Clement Pit-Claudel, Sorawee Porncharoenwase, Florian Rabe, Marianna Rapoport, Giles Reger, Cody Roux, Neha Rungta, Robin Salkeld, Matthias Schlaipfer, Daniel Schoepe, Johanna Schwartzentruber, Serdar Tasiran, Aaron Tomb, Emina Torlak, Jean-Baptiste Tristan, Lucas Wagner, Michael W. Whalen, Remy Willems, Tongtong Xiang, Taejoon Byun, Joshua Cohen, Ruijie Fang, Junyoung Jang, Jakob Rath, Hira Taqdees Syeda, Dominik Wagner, and Yongwei Yuan.
23. *Rango: Adaptive Retrieval-Augmented Proving for Automated Software Verification.* Robert Thompson, Nuno Saavedra, Pedro Carrott, Kevin Fisher, Alex Sanchez-Stern, Yuriy Brun, João F. Ferreira, Sorin Lerner, and Emily First.

Among the PC members, based on the inputs from the Area Chairs and other co-reviewers, we recognize the following **24** PC members as Distinguished Reviewers (in no particular order): Bianca Trinkenreich, Christopher Gerking, Christopher Poskitt, Dan Hao, Diego Elias Costa, Divya Gopinath, Emerson

Murphy-Hill, Eunsuk Kang, Ezekiel Soremekun, Joshua Garcia, Manuel Rigger, Marcel Bohme, Massimiliano (Max) Di Penta, Michael Vierhauser, Patrícia Matsubara, Ronnie de Souza Santos, Alexander Nolte, Gregorio Robles, Hong Jin Kang, Hung Viet Pham, Kelly Blincoe, Liliana Pasquale, Yintong Huo, and Zhenpeng Chen.

We offer our warm congratulations to the authors of the distinguished papers and to the distinguished reviewers!

Sustainable Community Review Effort (SCRE). This year we are piloting a scheme to reduce the effort of reviewing conference extensions that are submitted to the IEEE Transactions on Software Engineering (TSE) and the ACM Transactions on Software Engineering and Methodology (TOSEM) journals. By allowing journals to invite some of the reviewers of the original conference submission, we leverage all the effort these reviewers have already invested in understanding the contributions and limitations of the conference submission, reduce turnaround time, and improve consistency. We thank Mauro Pezzè and Sebastian Uchitel for this initiative.

Final Thanks. We thank *all* the authors for submitting their manuscripts to ICSE 2025. The ICSE 2025 program would not have been possible without their contributions. We also hope that the authors of the papers that have not *yet* been accepted have found the feedback received useful to improve their work.

Last, but not least, we would like to offer a big thank you to the ICSE 2025 General Chairs, Lionel Briand and Timothy Lethbridge, for their support and guidance, the ICSE 2024 Program Chairs, Abhik Roychoudhury and Margaret-Anne Storey, for their valuable suggestions provided to us after running a successful conference last year, and the Steering Committee of ICSE chaired by Arie van Deursen, for all the guidance and advice. We look forward to meeting all of the ICSE 2025 attendees at the conference and hope that you will find the program interesting and inspiring!

David Lo and Corina Păsăreanu,
ICSE 2025 Program Chairs