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Education

PhD, National University of Singapore, Singapore, 2006
Bachelor of Computing, National University of Singapore, Singapore, 2002

Academic Appointments

Professor of Computer Science, School of Computing and Information Systems, SMU, Jan 2022 - Present
Associate Professor of Computer Science, School of Computing and Information Systems, SMU, Apr 2021 - Dec 2021
Associate Professor of Information Systems, School of Computing and Information Systems, SMU, Apr 2019 - Mar 2021

Academic Administrative Positions

Co-Director, Centre for Research for Intelligent Software Engineering (RISE), Centre for Research on Intelligent Software Engineering, SMU, Apr 2023 - Present
Director, Research Lab for Intelligent Software Engineering, Centre for Research on Intelligent Software Engineering, SMU, Apr 2022 - Mar 2023
Lead Principal Investigator, School of Computing and Information Systems, SMU, Apr 2021 - Present
Deputy Director, Research Lab for Intelligent Software Engineering, Centre for Research on Intelligent Software Engineering, SMU, Apr 2020 - Mar 2022

RESEARCH

Research and Project Areas

Formal Methods, Software Engineering, and Cyber-Security

Publications

[Journal Articles \[Refereed\]](#)

Mitigating regression faults induced by feature evolution in deep learning systems, by YU, Hanmo; WANG, Zan; CHEN, Xuyang; CHEN, Junjie; SUN, Jun; LIU, Shuang; DONG, Zishuo. (2024). *ACM Transactions on Software Engineering and Methodology*, (Accepted)

A comprehensive formal specification of ARINC 653 with conformity proof, by FENG, Zhang; ZHAO, Yongwang; YANG, Liu; SUN, Jun. (2024). *Software: Testing, Verification and Reliability*, 1-17. <https://doi.org/10.1002/stvr.1901> (Published)

Partial solution based constraint solving cache in symbolic execution, by SHUAI, Ziqi; CHEN, Zhenbang; MA, Kelin; LIU, Kunlin; ZHANG, Yufeng; SUN, Jun; WANG, Ji. (2024). *Proceedings of the ACM on Software Engineering*, 1 (FSE), 2493-2514. <https://doi.org/10.1145/3660817> (Published)

sFuzz2.0: Storage-access pattern guided smart contract fuzzing, by WANG, Haoyu; WANG, Zan; LIU, Shuang; SUN, Jun; ZHAO, Yingquan; WAN, Yan; NGUYEN, Tai D.. (2024). *Journal of Software: Evolution and Process*, 36 (4), 1-20. <https://doi.org/10.1002/smr.2557> (Published)

Meta-Interpretive LEarning with Reuse, by WANG, Rong; SUN, Jun; TIAN, Cong; DUAN, Zhenhua. (2024). *Mathematics*, 12 (6), 1-20. <https://doi.org/10.3390/math12060916> (Published)

xFuzz: Machine learning guided cross-contract fuzzing, by XUE, Yinxing; YE, Jiaming; ZHANG, Wei; SUN, Jun; MA, Lei; WANG, Haijun; ZHAO, Jianjun. (2024). *IEEE Transactions on Dependable and Secure Computing*, 21 (2), 515-529. <https://doi.org/10.1109/TDSC.2022.3182373> (Published)

Attack as detection: Using adversarial attack methods to detect abnormal examples, by ZHAO, Zhe; CHEN, Guangke; LIU, Tong; LI, Taishan; SONG, Fu; WANG, Jingyi; SUN, Jun. (2024). *ACM Transactions on Software Engineering and Methodology*, 33 (3), 1-45. <https://doi.org/10.1145/3631977> (Published)

Provably secure decisions based on potentially malicious information, by WANG, Dongxia; MULLER, Tim; SUN, Jun. (2024). *IEEE Transactions on Dependable and Secure Computing*, 21 (5), 1-16. <https://doi.org/10.1109/TDSC.2024.3353295> (Published)

Refinement-based specification and analysis of multi-core ARINC 653 using Event-B, by ZHANG, Feng; ZHANG, Leping; ZHAO, Yongwang; LIU, Yang; SUN, Jun. (2023). *Formal Aspects of Computing*, 35 (4), 1-29. <https://doi.org/10.1145/3617183> (Published)

Better pay attention whilst fuzzing, by ZHU, Shunkai; WANG, Jingyi; SUN, Jun; YANG, Jie; LIN, Xingwei; ZHANG, Liyi; CHENG, Peng. (2023). *IEEE Transactions on Software Engineering*, 50 (2), 1-18. <https://doi.org/10.1109/TSE.2023.3338129> (Advance Online)

Boosting adversarial training in safety-critical systems through boundary data selection, by JIA, Yifan; POSKITT, Christopher M.; ZHANG, Peixin; WANG, Jingyi; SUN, Jun; CHATTOPADHYAY, Sudipta. (2023). *IEEE Robotics and Automation Letters*, 8 (12), 8350-8357. <https://doi.org/10.1109/LRA.2023.3327934> (Published)

Formalizing UML State Machines for Automated Verification - A Survey, by ETIENE, Andre; LIU, Shuang; LIU, Yang; CHOPPY, Christine; SUN, Jun; DONG, Jinsong. (2023). *ACM Computing Surveys*, 55 (13S), 1-47. <https://doi.org/10.1145/3579821> (Published)

Seed selection for testing deep neural networks, by ZHI, Yuhan; XIE, Xiaofei; SHEN, Chao; SUN, Jun; ZHANG, Xiaoyu; GUAN, Xiaohong. (2023). *ACM Transactions on Software Engineering and Methodology*, 33 (1), 1-33. <https://doi.org/10.1145/3607190> (Published)

Constructing cyber-physical system testing suites using active sensor fuzzing, by ZHANG, Fan; WU, Qianmei; XUAN, Bohan; CHEN, Yuqi; LIN, Wei; POSKITT, Christopher M.; SUN, Jun; CHEN, Binbin. (2023). *IEEE Transactions on Software Engineering*, 49 (11), 4829-4845. <https://doi.org/10.1109/TSE.2023.3309330> (Published)

K-ST: A formal executable semantics of the structured text language for PLCs, by WANG, Kun; WANG, Jingyi; POSKITT, Christopher M.; CHEN, Xiangxiang; SUN, Jun; CHENG, Peng. (2023). *IEEE Transactions on Software Engineering*, 49 (10), 4796-4813. <https://doi.org/10.1109/TSE.2023.3315292> (Published)

TESTSGD: Interpretable Testing of Neural Networks against Subtle Group Discrimination, by ZHANG, Mengdi; SUN, Jun; WANG, Jingyi; SUN, Bin. (2023). *ACM Transactions on Software Engineering and Methodology*, 32 (6), 1-24. <https://doi.org/10.1145/3591869> (Published)

QuoTe: Quality-oriented Testing for Deep Learning Systems, by CHEN, Jialuo; WANG, Jingyi; MA, Xingjun; SUN, Youcheng; SUN, Jun; ZHANG, Peixin; CHENG, Peng. (2023). *ACM Transactions on Software*

- Engineering and Methodology*, 32 (5), 1-33. <https://doi.org/10.1145/3582573> (Published)
- Specification-Based Autonomous Driving System Testing, by ZHOU, Yuan; SUN, Yang; TANG, Yun; CHEN, Yuqi; SUN, Jun; POSKITT, Christopher M.; LIU, Yang; YANG, Zijiang. (2023). *IEEE Transactions on Software Engineering*, 49 (6), 3391-3410. <https://doi.org/10.1109/TSE.2023.3254142> (Published)
- Achieving High MAP-Coverage Through Pattern Constraint Reduction, by ZHAO, Yingquan; WANG, Zan; LIU, Shuang; SUN, Jun; CHEN, Junjie; CHEN, Xiang. (2023). *IEEE Transactions on Software Engineering*, 49 (1), 99-112. <https://doi.org/10.1109/TSE.2022.3144480> (Published)
- Which neural network makes more explainable decisions? An approach towards measuring explainability, by ZHANG, Mengdi; SUN, Jun; WANG, Jingyi. (2022). *Automated Software Engineering*, 29 (2), 1-26. <https://doi.org/10.1007/s10515-022-00338-w> (Published)
- Guaranteeing Timed Opacity using Parametric Timed Model Checking, by ANDRÉ Étienne; LIME, Didier; MARINHO, Dylan; SUN, Jun. (2022). *ACM Transactions on Software Engineering and Methodology*, 31 (4), 1-36. <http://doi.org/10.1145/3502851> (Published)
- Physical Adversarial Attack on a Robotic Arm, by JIA, Yifan; POSKITT, Christopher M.; SUN, Jun; CHATTOPADHYAY, Sudipta. (2022). *IEEE Robotics and Automation Letters*, 7 (4), 9334-9341. <https://doi.org/10.1109/LRA.2022.3189783> (Published)
- Holistic combination of structural and textual code information for context based API recommendation, by CHEN, Chi; PENG, Xin; XING, Zhengchang; SUN, Jun; WANG, Xin; ZHAO, Yifan; ZHAO, Wenyun. (2022). *IEEE Transactions on Software Engineering*, 48 (8), 2987-3009. <https://doi.org/10.1109/TSE.2021.3074309> (Published)
- A Quantum interpretation of separating conjunction for local reasoning of Quantum programs based on separation logic, by LE, Xuan-Bach; LIN, Shang-Wei; SUN, Jun; SANAN, David. (2022). *Proceedings of the ACM on Programming Languages*, 6 (POPL), 1-27. <https://doi.org/10.1145/3498697> (Published)
- "More Than Deep Learning": post-processing for API sequence recommendation, by CHEN, Chi; PENG, Xin; CHEN, Bihuan; SUN, Jun; XING, Zhenchang; WANG, Xin; ZHAO, Wenyun. (2022). *Empirical Software Engineering*, 27 (1), 1-32. (Published)
- Enjoy your observability: an industrial survey of microservice tracing and analysis, by LI, Bowen; PENG, Xin; XIANG, Qilin; WANG, Hanzhang; XIE, Tao; SUN, Jun; LIU, Xuanzhe. (2022). *Empirical Software Engineering*, 27 (1), 1-28. <https://doi.org/10.1007/s10664-021-10063-9> (Published)
- Delta Debugging Microservice Systems with Parallel Optimization, by ZHOU, Xiang; PENG, Xin; XIE, Tao; SUN, Jun; JI, Chao; LI, Wenhua; DING, Dan. (2022). *IEEE Transactions on Services Computing*, 15 (1), 16-29. <https://doi.org/10.1109/TSC.2019.2919823> (Published)
- HRPDF: A Software-Based Heterogeneous Redundant Proactive Defense Framework for Programmable Logic Controller, by LIU, Ke; WANG, Jing-Yi; WEI, Qiang; ZHANG, Zhen-Yong; SUN, Jun; MA, Rong-Kuan; DENG, Rui-Long. (2021). *Journal of Computer Science and Technology*, 36 (6), 1307-1324. <https://doi.org/10.1007/s11390-021-1647-7> (Published)
- Adversarial attacks and mitigation for anomaly detectors of cyber-physical systems, by JIA, Yifan; WANG, Jingyi; POSKITT, Christopher M.; CHATTOPADHYAY, Sudipta; SUN, Jun; CHEN, Yuqi. (2021). *International Journal of Critical Infrastructure Protection*, 34 1-13. <https://doi.org/10.1016/j.ijcip.2021.100452> (Published)
- Automatic Fairness Testing of Neural Classifiers Through Adversarial Sampling, by ZHANG, Peixin; WANG, Jingyi; SUN, Jun; WANG, Xinyu; DONG, Guoliang; WANG, Xinggen; DAI, Ting; DONG, Jinsong. (2022). *IEEE Transactions on Software Engineering*, 48 (9), 1-20. <https://doi.org/10.1109/TSE.2021.3101478> (Advance Online)
- hPRESS: A Hardware-Enhanced Proxy Re-Encryption Scheme Using Secure Enclave, by ZHANG, Fan; LIANG, Ziyuan; ZUO, Cong; SHAO, Jun; NING, Jianting; SUN, Jun; LIU, Joseph K.; BAO, Yibao. (2021). *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 40 (6), 1144-1157. <https://doi.org/10.1109/TCAD.2020.3022841> (Published)
- Fault Analysis and Debugging of Microservice Systems: Industrial Survey, Benchmark System, and Empirical Study, by ZHOU, Xiang; PENG, Xin; XIE, Tao; SUN, Jun; JI, Chao; LI, Wenhua; DING, Dan. (2021). *IEEE Transactions on Software Engineering*, 47 (2), 243-260. <https://doi.org/10.1109/TSE.2018.2887384>

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Automated synthesis of local time requirement for service composition, by ANDRÉ, Étienne; TAN, Tian Huat; CHEN, Manman; LIU, Shuang; SUN, Jun; LIU, Yang; DONG, Jin Song. (2020). *Software and Systems Modeling*, 19 983-1013. (Published)

Automated synthesis of local time requirement for service composition, by ANDRÉ, Étienne; TAN, Tian Huat; CHEN, Manman; LIU, Shuang; SUN, Jun; LIU, Yang; DONG, Jin Song. (2020). *Software and Systems Modeling*, 19 (4), 1-31. <https://doi.org/10.1007/s10270-020-00787-5> (Published)

Explaining Regressions via Alignment Slicing and Mending, by WANG, Haijun; LIN, Yun; YANG, Zijiang; SUN, Jun; LIU, Yang; DONG, Jinsong; ZHENG, Qinghua; LIU, Ting. (2021). *IEEE Transactions on Software Engineering*, 47 (11), 1-17. <https://doi.org/10.1109/TSE.2019.2949568> (Published)

Automatically 'Verifying' Discrete-Time Complex Systems through Learning, Abstraction and Refinement, by WANG, Jingyi; SUN, Jun; QIN, Shengchao; JEGOUREL, Cyrille. (2021). *IEEE Transactions on Software Engineering*, 47 (1), 1-15. <https://doi.org/10.1109/TSE.2018.2886898> (Published)

Learning probabilistic models for model checking: an evolutionary approach and an empirical study, by WANG, Jingyi; SUN, Jun; YUAN, Qixia; PANG, Jun. (2018). *International Journal on Software Tools for Technology Transfer*, 20 (6), 689-704. <https://doi.org/10.1007/s10009-018-0492-7> (Published)

An Adaptive Markov Strategy for Defending Smart Grid False Data Injection From Malicious Attackers, by HAO, Jianye; KANG, Eunsuk; SUN, Jun; WANG, Zan; MENG, Zhaopeng; LI, Xiaohong; MING, Zhong. (2018). *IEEE Transactions on Smart Grid*, 9 (4), 2398-2408. <https://doi.org/10.1109/TSG.2016.2610582> (Published)

A Formal Specification and Verification Framework for Timed Security Protocols, by LI, Li; SUN, Jun; LIU, Yang; SUN, Meng; DONG, Jin Song. (2018). *IEEE Transactions on Software Engineering*, 44 (8), 725-746. <https://doi.org/10.1109/TSE.2017.2712621> (Published)

Towards Model Checking Android Applications, by BAI, Guangdong; YE, Quanqi; WU, Yongzheng; BOTHA, Heila; SUN, Jun; LIU, Yang; DONG, Jin Song; VISSER, Willem. (2018). *IEEE Transactions on Software Engineering*, 44 (6), 595-612. <https://doi.org/10.1109/TSE.2017.2697848> (Published)

A UTP semantics for communicating processes with shared variables and its formal encoding in PVS, by SHI, Ling; ZHAO, Yongxin; LIU, Yang; SUN, Jun; DONG, Jin Song; QIN, Shengchao. (2018). *Formal Aspects of Computing*, 30 351-380. (Published)

CrowdService: Optimizing Mobile Crowdsourcing and Service Composition, by PENG, Xin; GU, Jingxiao; TAN, Tian Huat; SUN, Jun; YU, Yijun; NUSEIBEH, Bashar; ZHAO, Wenyun Zhao. (2018). *ACM Transactions on Internet Technology*, 18 (2), A1-A23. <https://doi.org/10.1145/3108935> (Published)

Language Inclusion Checking of Timed Automata with Non-Zenoness, by WANG, Xinyu; SUN, Jun; WANG, Ting; QIN, Shengchao. (2017). *IEEE Transactions on Software Engineering*, 43 (11), 995-1008. <https://doi.org/10.1109/TSE.2017.2653778> (Published)

Efficient and Robust Emergence of Norms through Heuristic Collective Learning, by HAO, Jianye; SUN, Jun; CHEN, Guangyong; WANG, Zan; YU, Chao; MING, Zhong. (2018). *ACM Transactions on Autonomous and Adaptive Systems*, 12 (4), 23:1-23:20. <https://doi.org/10.1145/3127498> (Published)

Auditing Anti-Malware Tools by Evolving Android Malware and Dynamic Loading Technique, by XUE, Yinxing; MENG, Guozhu; LIU, Yang; TAN, Tian Huat; CHEN, Hongxu; SUN, Jun; ZHANG, Jie. (2017). *IEEE Transactions on Information Forensics and Security*, 12 (7), 1529-1544. <https://doi.org/10.1109/TIFS.2017.2661723> (Published)

Battery-Aware Mobile Data Service, by HE, Liang; MENG, Guozhu; GU, Yu; LIU, Cong; SUN, Jun; ZHU, Ting; LIU, Yang; SHIN, Kang G.. (2017). *IEEE Transactions on Mobile Computing*, 16 (6), 1544-1558. <https://doi.org/10.1109/TMC.2016.2597842> (Published)

IBED: Combining IBEA and DE for optimal feature selection in software product line engineering, by XUE, Yinxing; ZHONG, Jinghui; TAN, Tian Huat; LIU, Yang; CAI, Wentong; CHEN, Manman; SUN, Jun. (2016). *Applied Soft Computing*, 49 1215-1231. <https://doi.org/10.1016/j.asoc.2016.07.040> (Published)

Improved EGT-Based Robustness Analysis of Negotiation Strategies in Multiagent Systems via Model Checking, by SONG, Songzheng; HAO, Jianye; LIU, Yang; SUN, Jun; LEUNG, Ho-fung; ZHANG, Jie. (2016). *IEEE Transactions on Human-Machine Systems*, 46 (2), 197-208. <https://doi.org/10.1109/THMS.2015.2429573> (Published)

Formalizing and verifying stochastic system architectures using Monterey Phoenix, by SONG, Songzheng; ZHANG, Jiexin; LIU, Yang; AUGUSTON, Mikhail; SUN, Jun; DONG, Jin Song; CHEN, Tieming. (2016). *Software and Systems Modeling*, 15 (2), 453-471. <https://doi.org/10.1007/s10270-014-0411-7> (Published)

A Systematic Study on Explicit-State Non-Zenoness Checking for Timed Automata, by WANG, Ting; SUN, Jun; WANG, Xinyu; LIU, Yang; SI, Yuanjie; DONG, Jin Song; YANG, Xiaohu; LI, Xiaohong. (2015). *IEEE Transactions on Software Engineering*, 41 (1), 3-18. <https://doi.org/10.1109/TSE.2014.2359893> (Published)

Parameter synthesis for hierarchical concurrent real-time systems, by ANDRÉ, Étienne; LIU, Yang; SUN, Jun; DONG, Jin Song. (2014). *Real-Time Systems*, 50 (5-6), 620-679. <https://doi.org/10.1007/s11241-014-9208-6> (Published)

Towards verification of computation orchestration, by DONG, Jin Song; LIU, Yang; SUN, Jun; ZHANG, Xian. (2014). *Formal Aspects of Computing*, 26 (4), 729-759. <https://doi.org/10.1007/s00165-013-0280-9> (Published)

Model checking approach to automated planning, by LI, Yi; DONG, Jin Song; SUN, Jing; LIU, Yang; SUN, Jun. (2014). *Formal Methods in System Design*, 44 (2), 176-202. <https://doi.org/10.1007/s10703-013-0197-1> (Published)

Towards Formal Modelling and Verification of Pervasive Computing Systems, by LIU, Yan; ZHANG, Xian; LIU, Yang; DONG, Jin Song; SUN, Jun; BISWAS, Jit; MOKHTARI, Mounir. (2014). *Lecture Notes in Artificial Intelligence*, 8780 62-91. https://doi.org/10.1007/978-3-662-44871-7_3 (Published)

Learning Assumptions for Compositional Verification of Timed Systems, by LIN, Shang-Wei Lin, ANDRÉ, Étienne; LIU, Yang; SUN, Jun; DONG, Jin Song. (2014). *IEEE Transactions on Software Engineering*, 40 (2), 137-153. <https://doi.org/10.1109/TSE.2013.57> (Published)

Complexity of the Soundness Problem of Workflow Nets, by LIU, Guan Jun; SUN, Jun; LIU, Yang; DONG, Jin Song. (2014). *Fundamenta Informaticae*, 131 (1), 81-101. <https://doi.org/10.3233/FI-2014-1005> (Published)

Verifying Linearizability via Optimized Refinement Checking, by LIU, Yang; CHEN, Wei; LIU, Yanhong A.; SUN, Jun; ZHANG, Shao Jie; DONG, Jin Song. (2013). *IEEE Transactions on Software Engineering*, 39 (7), 1018-1039. <https://doi.org/10.1109/TSE.2012.82> (Published)

Modeling and Verifying Hierarchical Real-Time Systems Using Stateful Timed CSP, by SUN, Jun; LIU, Yang; DONG, Jin Song; LIU, Yan; SHI, Ling; ANDRÉ, Étienne. (2013). *ACM Transactions on Software Engineering and Methodology*, 22 (1), 3:1-3:29. <https://doi.org/10.1145/2430536.2430537> (Published)

Formal modeling and validation of Stateflow diagrams, by CHEN, Chunqing; SUN, Jun; LIU, Yang; DONG, Jin Song; ZHENG, Manchun. (2012). *International Journal on Software Tools for Technology Transfer*, 14 653-671. <https://doi.org/10.1007/s10009-012-0235-0> (Published)

A Verification System for Interval-Based Specification Languages, by CHEN, Chunqing; DONG, Jin Song; SUN, Jun; MARTIN, Andrew P.. (2010). *ACM Transactions on Software Engineering and Methodology*, 19 (4), 13:1-13:36. <https://doi.org/10.1145/1734229.1734232> (Published)

A formal framework for modeling and validating Simulink diagrams, by CHEN, Chunqing; DONG, Jin Song; SUN, Jun. (2009). *Formal Aspects of Computing*, 21 (5), 451-483. <https://doi.org/10.1007/s00165-009-0108-9> (Published)

Timed Automata Patterns, by DONG, Jin Song; HAO, Ping; QIN, Shengchao; SUN, Jun; YI, Wang. (2008). *IEEE Transactions on Software Engineering*, 34 (6), 844-859. <https://doi.org/10.1109/TSE.2008.52> (Published)

Design synthesis from interaction and state-based specifications, by SUN, Jun; DONG, Jin Song. (2006). *IEEE Transactions on Software Engineering*, 32 (6), 349-364. <https://doi.org/10.1109/TSE.2006.55> (Published)

Edited Books

FM 2014: Formal methods: 19th international symposium, edited by JONES, Cliff B.; PIHLAJASAARI, Pekka; SUN, Jun. (2014). Springer. (Published)

Conference Proceedings

Semantic conformance testing of relational DBMS, by LIU, Shuang; TIAN, Chenglin; SUN, Jun; WANG, Ruifeng; LU, Wei; ZHAO, Yongxin; XUE, Yinxing; WANG, Junjie; DU, Xiaoyong. (2025.0). *Proceedings of the 51st International Conference on Very Large Data Bases, London, 2025 September 1-5, UK*: (Accepted)

Unleashing the power of visual foundation models for generalizable semantic segmentation, by TANG, PeiYuan; ZHANG, Xiaodong; YANG, Chunze; YUAN, Haoran; SUN, Jun; SHAN, Danfeng; YANG, Ziji James. (2025.0). *Proceedings of the Thirty-Ninth AAAI Conference on Artificial Intelligence (AAAI-25), Philadelphia, Pennsylvania, February 25 - March 4, US*: (Accepted)

Training verification-friendly neural networks via neuron behavior consistency, by LIU, Zongxin; ZHAO, Zhe; SONG, Fu; SUN, Jun; YANG, Pengfei; HUANG, Xiaowei; ZHANG, Lijun. (2025.0). *Proceedings of the Thirty-Ninth AAAI Conference on Artificial Intelligence (AAAI-25), Philadelphia, Pennsylvania, February 25 - March 4, US*: (Accepted)

Automated program refinement: Guide and verify code large language model with refinement calculus, by CAI, Yufan; HOU, Zhe; SANAN, David; LUAN, Xiaokun; LIN, Yun; SUN, Jun; DONG, Jin Song. (2025.0). *Proceedings of the 52nd ACM SIGPLAN Symposium on Principles of Programming Languages (POPL 2025), Denver, Colorado, January 19-25, US*: (Accepted)

ALI-agent: Assessing LLMs' alignment with human values via agent-based evaluation, by ZHENG, Jingnan; WANG, Han; NGUYEN, Tai D.; ZHANG, An; SUN, Jun; CHUA, Tat-Seng. (2024.0). *Proceedings of the 38th Conference on Neural Information Processing Systems (NeurIPS 2024), Vancouver, Canada, December 10-15*, (pp. 1-49) US: <https://doi.org/10.48550/arXiv.2405.14125> (Published)

Towards general conceptual model editing via adversarial representation engineering, by ZHANG, Yihao; WEI, Zeming; SUN, Jun; SUN, Meng. (2024.0). *Proceedings of the 38th Conference on Neural Information Processing Systems (NeurIPS 2024), Vancouver, Canada, December 10-15*, (pp. 1-22) US: <https://doi.org/10.48550/arXiv.2404.13752> (Published)

Defending large language models against jailbreak attacks via layer-specific editing, by ZHAO, Wei; LI, Zhe; LI, Yige; ZHANG, Ye; SUN, Jun. (2024.0). *Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP 2024), Miami, Florida, November 12-16*, (pp. 5094-5109) US: <https://doi.org/10.48550/arXiv.2405.18166> (Published)

Revisiting the conflict-resolving problem from a semantic perspective, by DONG, Jinhao; SUN, Jun; LIN, Yun; ZHANG, Yedi; MA, Murong; DONG, Jin Song; HAO, Dan. (2024.0). *ASE '24: Proceedings of the 39th IEEE/ACM International Conference on Automated Software Engineering, Sacramento CA USA, October 27 - November 1*, (pp. 141-152) New York: ACM. <https://doi.org/10.1145/3691620.3694993> (Published)

Certified continual learning for neural network regression, by PHAM, Hong Long; SUN, Jun. (2024.0). *Proceedings of the ACM SIGSOFT International Symposium on Software Testing and Analysis, ISSTA 2024, Vienna, Austria, September 16-20*, (pp. 1-13) New York: ACM. (Accepted)

Certified quantization strategy synthesis for neural networks, by ZHANG, Yedi; CHEN, Guangke; SONG, Fu; SUN, Jun; DONG, Jin Song. (2024.0). *Formal Methods: 26th International Symposium FM 2024, Milan, September 9-13: Proceedings*, (pp. 343-362) Cham: Springer. https://doi.org/10.1007/978-3-031-71162-6_18 (Published)

Neural network semantic backdoor detection and mitigation: A causality-based approach, by SUN, Bing; SUN, Jun; KOH, Wayne; SHI, Jie. (2024.0). *Proceedings of the 33rd USENIX Security Symposium, Philadelphia, USA, 2024 August 14-16*, (pp. 1-18) USA: Usenix. (Published)

Certified robust accuracy of neural networks are bounded due to Bayes errors, by ZHANG, Ruihan; SUN, Jun. (2024.0). *Proceedings of the 36th International Conference, CAV 2024 Montreal, Canada, 2024 July 24-27*, (pp. 352-376) Cham: Springer. https://doi.org/10.1007/978-3-031-65630-9_18 (Published)

REDriver: Runtime enforcement for autonomous vehicles, by SUN, Yang; POSKITT, Christopher M.; ZHANG, Xiaodong; SUN, Jun. (2024.0). *ICSE '24: Proceedings of the 46th International Conference on Software Engineering, Lisbon, Portugal, April 14-20*, (pp. 1-12) New York: ACM. <https://doi.org/10.1145/3597503.3639151> (Published)

ACAV: A framework for automatic causality analysis in autonomous vehicle accident recordings, by SUN, Huijia; POSKITT, Christopher M.; SUN, Yang; SUN, Jun; CHEN, Yuqi. (2024.0). *ICSE '24: Proceedings of the 46th International Conference on Software Engineering, Lisbon, Portugal, April 14-18*, (pp. 1-13) New York:

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AUTHSCAN: Automatic extraction of web authentication protocols from implementations, by BAI, Guangdong; LEI, Jike; MENG, Guozhu; VENKATRAMAN, Sai Sathyanarayan; SAXENA, Prateek; SUN, Jun; LIU, Yang; DONG, Jin Song. (2013.0). *Proceedings of the 20th Annual Network and Distributed System Security Symposium, NDSS 2013, San Diego, California, February 24-27*, (pp. 1-20) San Diego, California: (Published)

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Automatic generation of provably correct embedded systems, by LIN, Shang-Wei; LIU, Yang; HSIUNG, Pao-Ann; SUN, Jun; DONG, Jin Song. (2012.0). *Proceedings of the 14th International Conference on Formal Engineering Methods, ICFEM 2012, Kyoto, Japan, November 12-16*, (pp. 214-229) Japan: Springer Link. https://doi.org/10.1007/978-3-642-34281-3_17 (Published)

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- A model checker for hierarchical probabilistic real-time systems, by SONG, Songzheng; SUN, Jun; LIU, Yang; DONG, Jin Song. (2012.0). *Proceedings of the 24th International Conference, CAV 2012, Berkeley, CA, USA, July 7-13*, (pp. 705-711) Berkeley, CA, USA: Springer Link. https://doi.org/10.1007/978-3-642-31424-7_53 (Published)
- Complexity of the soundness problem of bounded workflow nets, by LIU, Guan Jun; SUN, Jun; LIU, Yang; DONG, Jin Song. (2012.0). *Proceedings of the 33rd International Conference, PETRI NETS 2012, Hamburg, Germany, June 25-29*, (pp. 92-107) Hamburg, Germany: Springer Link. https://doi.org/10.1007/978-3-642-31131-4_6 (Published)
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- On combining state space reductions with global fairness assumptions, by ZHANG, Shao Jie; SUN, Jun; PANG, Jun; LIU, Yang; DONG, Jin Song. (2011.0). *Proceedings of the 17th International Symposium on Formal Methods, Limerick, Ireland, June 20-24*, (pp. 432-447) Ireland: Springer Link. https://doi.org/10.1007/978-3-642-21437-0_32 (Published)

- Model-based methods for linking web service choreography and orchestration, by SUN, Jun; LIU, Yang; DONG, Jin Song; PU, Geguang; TAN, Tian Huat. (2010.0). *Proceedings of the 17th Asia Pacific Software Engineering Conference, APSEC 2010, Sydney, Australia, November 30 - December 3*, (pp. 166-175) Australia: IEEE. <https://doi.org/10.1109/APSEC.2010.28> (Published)
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- Developing model checkers using PAT, by LIU, Yang; SUN, Jun; DONG, Jin Song. (2010.0). *Proceedings of the 8th International Symposium, ATVA 2010, Singapore, September 21-24*, (pp. 371-377) Singapore: Springer Link. https://doi.org/10.1007/978-3-642-15643-4_30 (Published)
- Scalable multi-core model checking fairness enhanced systems, by LIU, Yang; SUN, Jun; DONG, Jin Song. (2009.0). *Proceedings of the 11th International Conference on Formal Engineering Methods, ICFEM 2009, Rio de Janeiro, Brazil, December 9-12*, (pp. 426-445) Rio de Janeiro, Brazil: Springer Link. https://doi.org/10.1007/978-3-642-10373-5_22 (Published)
- Verifying stateful timed CSP using implicit clocks and zone abstraction, by SUN, Jun; LIU, Yang; DONG, Jin Song; ZHANG, Xian. (2009.0). *Proceedings of the 11th International Conference on Formal Engineering Methods, ICFEM 2009, Rio de Janeiro, Brazil, December 9-12*, (pp. 581-600) Rio de Janeiro, Brazil: Springer Link. https://doi.org/10.1007/978-3-642-10373-5_30 (Published)
- Fair model checking with process counter abstraction, by SUN, Jun; LIU, Yang; ROYCHOUDHURY, Abhik; LIU, Shanshan; DONG, Jin Song. (2009.0). *Proceedings of the Second World Congress Eindhoven, The Netherlands, 2009 November 2-6*, (pp. 123-139) Eindhoven, The Netherlands: Springer Link. https://doi.org/10.1007/978-3-642-05089-3_9 (Published)
- Model checking linearizability via refinement, by LIU, Yang; CHEN, Wei; LIU, Yanhong A.; SUN, Jun Sun. (2009.0). *Proceedings of the Second World Congress Eindhoven, The Netherlands, 2009 November 2-6*, (pp. 321-337) Eindhoven, The Netherlands: Springer Link. https://doi.org/10.1007/978-3-642-05089-3_21 (Published)
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- Integrating specification and programs for system modeling and verification, by SUN, Jun; LIU, Yang; DONG, Jin Song; CHEN, Chunqing. (2009.0). *Proceedings of the 2009 Third IEEE International Symposium on Theoretical Aspects of Software Engineering, Tianjin, China, July 29-31*, (pp. 127-135) Tianjin, China: IEEE. <https://doi.org/10.1109/TASE.2009.32> (Published)
- Formal verification of scalable nonzero indicators, by ZHANG, Shao Jie; LIU, Yang; SUN, Jun; DONG, Jin Song; CHEN, Wei; LIU, Yanhong A.. (2009.0). *Proceedings of the 21st International Conference on Software Engineering & Knowledge Engineering (SEKE'2009), Boston, July 1-3*, (pp. 406-411) USA: (Published)
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- Specifying and verifying sensor networks: An experiment of formal methods, by DONG, Jin Song; SUN, Jing; SUN, Jun; TAGUCHI, Kenji; ZHANG, Xian. (2008.0). *Proceedings of the 10th International Conference on Formal Engineering Methods, ICFEM 2008, Kitakyushu-City, Japan, October 27-31*, (pp. 318-337) Kitakyushu-City, Japan: Springer Link. https://doi.org/10.1007/978-3-540-88194-0_20 (Published)

Specifying and verifying event-based fairness enhanced systems, by SUN, Jun; LIU, Yang; DONG, Jin Song; WANG, Hai H.. (2008.0). *Proceedings of the 10th International Conference on Formal Engineering Methods, ICFEM 2008, Kitakyushu-City, Japan, October 27-31*, (pp. 5-24) Kitakyushu-City, Japan: Springer Link. https://doi.org/10.1007/978-3-540-88194-0_4 (Published)

Model checking CSP revisited: Introducing a process analysis toolkit, by SUN, Jun; LIU, Yang; DONG, Jin Song. (2008.0). *Proceedings of Third International Symposium, ISoLA 2008, Porto Sani, Greece, October 13-15*, (pp. 307-322) Greece: Springer Link. https://doi.org/10.1007/978-3-540-88479-8_22 (Published)

Bounded model checking of compositional processes, by SUN, Jun; LIU, Yang; DONG, Jin Song; SUN, Jing. (2008.0). *Proceedings of the 2nd IFIP/IEEE International Symposium on Theoretical Aspects of Software Engineering, TASE 2008, Nanjing, China, June 17-19*, (pp. 1-8) Nanjing, China: IEEE. <https://doi.org/10.1109/TASE.2008.12> (Published)

A verification system for timed interval calculus, by CHEN, Chungqing; DONG, Jin Song; SUN, Jun. (2008.0). *Proceedings of the 30th International Conference on Software Engineering (ICSE 2008), Leipzig, Germany, 2008 May 10-18*, (pp. 271-280) Germany: IEEE. <https://doi.org/10.1145/1368088.1368126> (Published)

A scalable approach to multi-style architectural modeling and verification, by WONG, Stephen; SUN, Jing; WARREN, Ian; SUN, Jun. (2008.0). *Proceedings of the 13th International Conference on Engineering of Complex Computer Systems (ICECCS 2008), Belfast, Northern Ireland, March 31 - April 4*, (pp. 25-34) Belfast, Northern Ireland: IEEE. <https://doi.org/10.1109/ICECCS.2008.16> (Published)

A formal model of semantic Web Service Ontology (WSMO) execution, by WANG, Hai H.; GIBBINS, Nick; PAYNE, Terry R.; SALEH, Ahmed; SUN, Jun. (2008.0). *Proceedings of the 13th International Conference on Engineering of Complex Computer Systems (ICECCS 2008), Belfast, Northern Ireland, March 31 - April 4*, (pp. 111-120) Belfast, Northern Ireland: IEEE. <https://doi.org/10.1109/ICECCS.2008.25> (Published)

Machine-assisted proof support for validation beyond Simulink, by CHEN, Chungqing; DONG, Jin Song; SUN, Jun. (2007.0). *Proceedings of the 9th International Conference on Formal Engineering Methods, ICFEM 2007, Boca Raton, FL, USA, November 14-15*, (pp. 95-115) Boca Raton, FL, USA: Springer Link. https://doi.org/10.1007/978-3-540-76650-6_7 (Published)

Realizing live sequence charts in system verilog, by WANG, Hai H.; QIN, Shengchao; SUN, Jun; DONG, Jin Song. (2007.0). *Proceedings of the First Joint IEEE/IFIP Symposium on Theoretical Aspects of Software Engineering, TASE 2007, Shanghai, China, June 6-8*, (pp. 379-388) Shanghai, China: <https://doi.org/10.1109/TASE.2007.41> (Published)

Synthesis of distributed processes from scenario-based specifications, by SUN, Jun; DONG, Jin Song. (2005.0). *Proceedings of 2005 International Symposium of Formal Methods Europe, Newcastle, UK, July 18-22*, (pp. 415-431) Newcastle, UK: Springer Link. https://doi.org/10.1007/11526841_28 (Published)

Research Grants

Singapore Management University

Executable AI Semantics for AI Framework Analysis, Academic Research Fund (AcRF) Tier 2, Ministry of Education (MOE) , PI (Project Level): SUN Jun, 2023, S\$648,713

Trustworthy AI Centre NTU (TAICeN), Cyber Security Agency of Singapore (CSA) , Co-PI (Project Level): XIE Xiaofei, SUN Jun, 2023

The Science of Certified AI Systems, Academic Research Fund (AcRF) Tier 3, Ministry of Education (MOE) , PI (Project Level): SUN Jun , Co-PI (Project Level): David LO, JIANG Lingxiao, 2021, S\$9,340,776

Trust to Train and Train to Trust: Agent Training Programs for Safety-Critical Environments, AI Singapore Research Programme, AI Singapore , PI (Project Level): Pradeep Reddy VARAKANTHAM , Co-PI (Project Level): Akshat KUMAR, Arunesh SINHA, David LO, 2021, S\$6,086,963.76

Research Programme on Computational Law, Smart Systems Strategic Research Programme, Industry Alignment Fund – Pre-Positioning (IAF-PP) Funding Initiative, Info-communications Media Development Authority of Singapore (IMDA) , PI (Project Level): WONG Meng Weng , Co-PI (Project Level): GOH Yihan, SC, LAU Kwan Ho, LIM How Khang, Jerrold SOH, 2019, S\$15,189,082

Explaining AI with the Right Level of Abstraction, AI Singapore Research Programme, AI Singapore , PI (Project Level): SUN Jun, 2019, S\$749,904

SpecTest: Specification-based Compiler Fuzzing, NSoE TSS Grant Call, National Satellite of Excellence - Trustworthy Software Systems , PI (Project Level): SUN Jun, 2019, S\$715,000

Monitor Only if You Cannot Verify, Academic Research Fund (AcRF) Tier 2, Ministry of Education (MOE) , PI (Project Level): SUN Jun, 2019, S\$577,800

Towards Practical Attestation Solutions for Countering Advanced Attacks to Industrial Control Systems, NSoE DeST-SCI Grant Call, National Satellite of Excellence - Design Science and Technology for Secure Critical Infrastructure , Co-PI (Project Level): SUN Jun, 2019, S\$939,180

Provable Mitigation of Side Channel through Parametric Verification, NRF-ANR Joint Grant Call, National Research Foundation (NRF) , PI (Project Level): SUN Jun, 2019, S\$450,000

Improving Fairness of Large Language Models Non-intrusively, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): SUN Jun, 2024, S\$120,000

Towards Automatic Validation of AI-Generated Code, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): SUN Jun, 2024, S\$175,000

Automatic non-linear loop summarization and its applications, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): XIE Xiaofei, 2021, S\$100,000

Testing and Verification of Artificial Intelligence Systems, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): David LO , Co-PI (Project Level): JIANG Lingxiao, SUN Jun, 2019, S\$468,035

"Follow the Money": Targeted Smart Contracts Analysis, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): SUN Jun, 2018, S\$100,000

Other Institutions

Testing and Defending AI-Systems Holistically, Huawei, Huawei PI (Project Level): SUN Jun, 2019, SGD339,000

Provable Mitigation of Side Channel through Parametric Verification, ProMIS, NRF-ANR PI (Project Level): SUN Jun, 2019, SGD450,000

Constraint Solving based on Optimization, industry grant, Singapore Huawei PI (Project Level): SUN Jun, SGD500,000

TEACHING

Courses Taught

Singapore Management University

Undergraduate Programmes :

AI Safety

Computational Thinking

Design and Analysis of Algorithms

Fairness in Socio-technical Systems

Guided Advanced Research in Computer Science

Guided Advanced Research in Computing

Guided Research in Computer Science
Guided Research in Computer Science II
Guided Research in Computing
Guided Research in Computing 2
Software Project Management
Web Application Development II

Postgraduate Professional Programmes :

AI System Evaluation
Capstone Project - Cybersecurity
Capstone Project - Data Science and Engineering

Postgraduate Research Programmes :

Empirical Research Project 1
Empirical Research Project 2
Empirical Research Project 3
Empirical Research Project 4

Consultancy

Huawei Pte Ltd, Apr 2019 - Mar 2020

EXTERNAL SERVICE – PROFESSIONAL

Committee Member, FM 2021, 2021
Committee Member, ASE 2021, 2021
Committee Member, FSE 2021, 2021
Committee Member, ICSE 2021, 2021
Committee Chair, Internetwork 2020, 2021
Presenter Keynote Address, International Conference on Formal Engineering Methods (ICFEM2021), 2021
Committee Chair, General Chair, APSEC 2020, 2020
Committee Member, ICSE 2020, 2019 - Present
Committee Member, ICSE 2019, 2019 - Present
Committee Member, ASE2019, 2019 - Present
Committee Member, FM 2019, 2019 - Present
Conference Chair, SETTA 2019, 2019 - Present

Committee Member, International Conferences: ATVA 2019, FORMATS 2019, QRS 2019, ICSE SRC 2019, TASE 2019, ICFEM 2019, 2019 - Present

Committee Member, ISSTA 2019, 2019 - Present

Conference Chair, Program Chair, International Symposium on Formal Methods 2014, 2014