

Yahui Song

Software Developer, Core Strats · Standard Chartered Bank

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RESEARCH INTERESTS & MOTIVATION

My research sits at the intersection of **programming languages**, **formal methods**, and **real-world software engineering**. I develop techniques for program verification, static analysis, automated repair, and correctness proofs, grounded in temporal logics, separation logic, and symbolic computation with extended regular expressions.

Beyond academia, I am deeply interested in applying rigorous formal methods to **high-stakes domains** — particularly **finance and trading systems**, where correctness, timing, and behavioural guarantees directly translate into economic value. My current role in *Core Strats* at Standard Chartered Bank lets me bridge formal reasoning with production financial software, and I see great potential in bringing program-analysis tools to the correctness of quantitative models, risk engines, and automated-trading pipelines.

EDUCATION

Ph.D. in Computer Science, School of Computing, NUS 2018 – 2023

Thesis: *Symbolic Temporal Verification Techniques with Extended Regular Expressions*

Supervisor: Assoc. Prof. Wei-Ngan Chin Committee: Prof. Joxan Jaffar, Prof. Jin Song Dong

M.Comp. in Computer Science, School of Computing, NUS 2017 – 2018

Thesis: *Programming Abstraction for IoT Devices*

Supervisor: Assoc. Prof. Wei-Ngan Chin

B.Eng. in Computer Science, Sun Yat-sen University, China 2013 – 2017

Thesis: *Design and Implementation of House Roaming Interaction System Based on Unity3D*

Focus: Software Engineering, Systems Analysis, Virtual Reality

PROFESSIONAL EXPERIENCE

Software Developer — Core Strats, Standard Chartered Bank, Singapore July 2025 – Present

Applying formal and algorithmic methods to financial software within the bank’s quantitative strategies group. Bridging programming-language research with production systems in the finance domain.

Research Fellow — Automated Program Repair Group, NUS Jan 2023 – July 2025

Worked with Prof. Abhik Roychoudhury and Prof. Wei-Ngan Chin on temporal-property-guided program repair and agentic software verification. Continued collaboration after joining SCB.

PEER-REVIEWED RESEARCH PAPERS

TSE 2026 **Detecting LLM Fact-conflicting Hallucinations Enhanced by Temporal-logic-based Reasoning**

by Ningke Li*, Yahui Song*, Kailong Wang, Yuekang Li, Ling Shi, Yi Liu, Haoyu Wang

IEEE Transactions on Software Engineering

TSE 2026 **Computation Tree Logic Guided Program Repair**

by Yu Liu*, Yahui Song*, Martin Mirchev, Abhik Roychoudhury

IEEE Transactions on Software Engineering

FSE 2026 **Agentic Verification of Software Systems**

by Haoxin Tu, Huan Zhao, Yahui Song, Mehtab Zafar, Ruijie Meng, Abhik Roychoudhury

ACM International Conference on the Foundations of Software Engineering, Montreal, Canada

SAS 2025 **Specifying and Verifying Future Conditions**

by Yahui Song, Darius Foo, Wei-Ngan Chin

32nd Static Analysis Symposium, Singapore

TACAS 2025 **Inferring Incorrectness Specifications for Object-Oriented Programs**

by Wenhua Li, Quang Loc Le, Yahui Song, Wei-Ngan Chin

31st International Conference on Tools and Algorithms for the Construction and Analysis of Systems, Hamilton, Canada

ICFP 2024 Specification and Verification for Unrestricted Algebraic Effects and Handling

by Yahui Song, Darius Foo, Wei-Ngan Chin

29th ACM SIGPLAN International Conference on Functional Programming, Milan, Italy

FM 2024 Staged Specification Logic for Verifying Higher-Order Imperative Programs

by Darius Foo, Yahui Song, Wei-Ngan Chin

26th International Symposium on Formal Methods, Milan, Italy

FSE 2024 ProveNFix: Temporal Property Guided Program Repair

by Yahui Song, Xiang Gao, Wenhua Li, Wei-Ngan Chin, Abhik Roychoudhury

ACM International Conference on the Foundations of Software Engineering, Porto de Galinhas, Brazil

ACM SIGSOFT Distinguished Paper Award

APLAS 2023 Incorrectness Proofs for Object-Oriented Programs via Subclass Reflection

by Wenhua Li, Quang Loc Le, Yahui Song, Wei-Ngan Chin

21st Asian Symposium on Programming Languages and Systems, Taipei

TACAS 2023 Automated Verification for Real-Time Systems

by Yahui Song, Wei-Ngan Chin

29th International Conference on Tools and Algorithms for the Construction and Analysis of Systems, Paris, France

APLAS 2022 Automated Temporal Verification for Algebraic Effects

by Yahui Song, Darius Foo, Wei-Ngan Chin

20th Asian Symposium on Programming Languages and Systems, Auckland, New Zealand

VMCAI 2021 A Synchronous Effects Logic for Temporal Verification of Pure Esterel

by Yahui Song, Wei-Ngan Chin

22nd International Conference on Verification, Model Checking, and Abstract Interpretation

ICFEM 2020 Automated Temporal Verification of Integrated Dependent Effects

by Yahui Song, Wei-Ngan Chin

22nd International Conference on Formal Engineering Methods, Singapore

THESES & PREPRINTS

PhD Thesis Symbolic Temporal Verification Techniques with Extended Regular Expressions, Doctor of Philosophy, Department of Computer Science, NUS, 2023

Supervisor: Wei-Ngan Chin Committee: Joxan Jaffar, Jin Song Dong

MSc Thesis Programming Abstraction for IoT Devices, Master of Computing, Department of Computer Science, NUS, 2018

Supervisor: Wei-Ngan Chin

TALKS

May 2026 *Linear Temporal Logic and Future Conditions* — Core Strats, Standard Chartered Bank

Jun 2025 *Future Conditions: Temporal Property Guided Program Analysis, Repair and Verification*
Zoom talk, Prof. Yulei Sui's group, University of New South Wales (UNSW)

Dec 2024 *CTL Repair* (ongoing work) — SG Programming Languages Summit, Singapore

Oct 2024 *ProveNFix and Future Conditions*

Zoom talk, Prof. Yun Lin's group, Shanghai Jiao Tong University

Sep 2024 *Future Conditions* — ETH Zürich, Prof. Zhendong Su's Group

Sep 2024 *Higher-Order Effects* — EPFL PL Seminar, hosted by Prof. Viktor Kunčák

Sep 2024 *Higher-Order Effects* — ETH Zürich, Prof. Peter Müller's Group

Nov 2022 PhD thesis talk — LSD Seminar, UC Santa Cruz, hosted by Prof. Lindsey Kuper

AWARDS & HONOURS

- ACM SIGSOFT Distinguished Paper Award — FSE 2024
- Honor List of Student Tutors for Excellence of Teaching, NUS, 2020–2021
- NUS Research Scholarship, 2018–2022 (Ph.D)
- First Prize, Student Research Competition — APLAS 2018
- First Prize, GSAC 2018 Singapore Hackathon — Scheduling Algorithm Competition (Alibaba & Lazada)

PROFESSIONAL SERVICE

- **Program Committee:** JFP’26, Haskell’26, TOSEM’25, ICSE’26, ICFP’25, SRC@SPLASH’25, HOPE’25, OCaml’25, APR@ICSE’25, TASE’24 and its Special Journal Issue, STTT’21 (RV’21 Special Issue)
- **Artifact Evaluation Committee:** CAV’23, CAV’22, PLDI’22, POPL’22, ESOP’22

TEACHING

- **TA** — IT5100A: Typed Functional Programming in Practice (Dr. Wei-Ngan Chin & Dr. Razvan Voicu) Sem 2, 2021/22
- **TA** — TIC2701: Principles of Programming Languages Sem 1, 2020/21
- **TA** — CS2104: Programming Language Concepts Sem 1, 2020/21
- **Grader** — YSC1212: Introduction to Computer Science (Yale-NUS College) Sem 1, 2020/21
- **TA** — CS4215: Programming Language Implementation Sem 2, 2018/19
- **TA** — CS3203: Software Engineering Project Sem 2 2020/21; Sem 1&2 2019/20; Sem 2 2018/19
- **TA** — CS3219: Software Engineering Principles and Patterns Sem 1 2020/21; Sem 1&2 2019/20; Sem 1 2018/19; Sem 1 2017/18