

# Yahui Song

Research Fellow

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## Research Interest

My research focuses on programming languages, particularly functional programming, specification and verification, logics such as temporal logic and separation logic, as well as their applications in bug finding and automated program repair.

## Working Experience

- Research Fellow, School of Computing, National University of Singapore. 02/2023 - present
- Research Assistant, School of Computing, National University of Singapore. 09/2017 - 06/2018

## Education

- Ph.D., Computer Science, National University of Singapore. 08/2018 - 05/2023
- M.S., Computer Science, National University of Singapore. 08/2017 - 06/2018
- B.S., Computer Science, Sun Yat-sen University. 09/2013 - 07/2017

## Publication

### **Inferring Incorrectness Specifications for Object-Oriented Programs (TACAS2025)**

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

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

### **Specification and Verification for Unrestricted Algebraic Effects and Handling (ICFP2024)**

Yahui Song, Darius Foo, Wei-Ngan Chin

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

### **Staged Specification Logic for Verifying Higher-Order Imperative Programs (FM2024)**

Darius Foo, Yahui Song, Wei-Ngan Chin

*The 26th International Symposium on Formal Methods, Milan, Italy.*

### **ProveNFix: Temporal Property guided Program Repair (FSE2024)**

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

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

**ACM SIGSOFT Distinguished Paper Award**

### **Incorrectness Proofs for Object-Oriented Programs via Subclass Reflection (APLAS2023)**

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

*The 21st Asian Symposium on Programming Languages and Systems, Taipei.*

### **Automated Verification for Real-Time Systems (TACAS2023)**

Yahui Song, Wei-Ngan Chin.

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

### **Automated Temporal Verification for Algebraic Effects (APLAS2022)**

Yahui Song, Darius Foo, Wei-Ngan Chin.

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

## **A Synchronous Effects Logic for Temporal Verification of Pure Esterel** ([VMCAI2021](#))

Yahui Song, Wei-Ngan Chin.

*The 22nd International Conference on Verification, Model Checking, and Abstract Interpretation, Online.*

## **Automated Temporal Verification of Integrated Dependent Effects** ([ICFEM2020](#))

Yahui Song, Wei-Ngan Chin.

*The 22nd International Conference on Formal Engineering Methods, Singapore.*

## **Theses and Preprints**

- **Detecting LLM Fact-conflicting Hallucinations Enhanced by Temporal-logic-based Reasoning** ([Arxiv](#))  
- by Ningke Li\*, [Yahui Song\\*](#), Kailong Wang, Yuekang Li, Ling Shi, Yi Liu, and Haoyu Wang.
- **Computation Tree Logic guided Program Repair** ([Arxiv](#))  
- by Yu Liu\*, [Yahui Song\\*](#), Martin Mirchev, Sergey Mechtaev, and Abhik Roychoudhury.
- **Automated Temporal Verification for Preemptive Asynchronous Programs** ([pdf](#))  
- by [Yahui Song](#), Wei-Ngan Chin.
- **Symbolic Temporal Verification Techniques with Extended Regular Expressions** ([PHD THESIS \(2023\)](#))  
- Supervisor: Wei-Ngan Chin.  
- Committee: Joxan Jaffar, Jin Song Dong.
- **Automated Temporal Verification for Preemptive Asynchronous Programs** ([pdf](#))  
- by [Yahui Song](#), Wei-Ngan Chin.
- **An SQL Frontend on top of OCaml for Data Analysis** (presented at IFL'22 Denmark) ([pdf](#))  
- by Yan Dong, [Yahui Song](#), Wei-Ngan Chin.
- **Programming Abstraction for IoT Devices** ([MASTER THESIS \(2018\)](#))  
- Supervisor: Wei-Ngan Chin, co-supervised by Mahmudul Faisal Al Ameen.  
- Committee: Siau-Cheng Khoo, Hugh Anderson.

## **Service**

- Program committee member of ICSE2026, ICFP2025, SRC@SPLASH2025, OCaml2025, HOPE2025, APR@ICSE2025, TASE2024 and its Special Journal Issue, STTT2021 (RV2021 Special Journal Issue). Subreviewer of POPL2022.
- Artifact evaluation committee member of CAV2023, CAV2022, PLDI2022, POPL2022, ESOP2022.

## **Teaching Experience**

- TA for IT5100A in School of Computing (Soc): Typed Functional Programming in Practice, Semester 2, 2021/2022  
- with Dr. Wei-Ngan Chin and Dr. Razvan Voicu.
- TA for TIC2701 in Soc: Principles of Programming Languages [\[Feedback Report\]](#) Semester 1, 2020/2021  
- with Dr. PRABAWA Adi Yoga Sidi
- TA for CS2104 in Soc: Programming Language Concepts [\[Feedback Report\]](#) Semester 1, 2020/2021  
- with Dr. Wei-Ngan Chin.
- TA for YSC1212 in Yale-NUS College: Introduction to Computer Science Semester 1, 2020/2021  
- with Dr. Aquinas Hobor
- TA for CS4215 in Soc: Programming Language Implementation Semester 2, 2018/2019  
- with Dr. Razvan Voicu.
- TA for CS3203 in Soc: Software Engineering Project Semester 2, 2020/2021  
- with Dr. ZHAO Jin and Dr. Cristina CARBUNARU [\[Feedback Report\]](#) Semester 1 & 2, 2019/2020  
[\[Feedback Report\]](#) Semester 2, 2018/2019

- TA for CS3219 in Soc: Software Engineering Principles and Patterns  
- with Dr. Bimlesh WADHWA

Semester 1, 2020/2021  
Semester 1 & 2, 2019/2020  
Semester 1, 2017/2018, Semester 1, 2018/2019

## Others

- Talks at Shanghai Jiao Tong University (Oct 2024) and SG Programming Languages Summit (Dec 2024).
- Talks at ETH Zürich, and the EPFL PL Seminar, Sep 2024.
- Talk at *the Languages, Systems, and Data* (LSD) Seminar at UCSC, Nov 2022.
- **Honor List of Student Tutors for Excellence of Teaching, 2020-2021.**
- Presentations at *the symposium on Implementation and Application of Functional Languages* (IFL) 2019 and 2022.
- Presentations at NUS Soc Research Week 2019, and 2021.
- **First Prize of Student Research Competition at APLAS2018.**

## Referees

- [Wei-Ngan Chin](#) (thesis advisor)  
Associate Professor, National University of Singapore  
Email: chinwn@comp.nus.edu.sg
- [Abhik Roychoudhury](#)  
Provost's Chair Professor, National University of Singapore  
Email: abhik@comp.nus.edu.sg
- [Joxan Jaffar](#)  
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- [Jin Song Dong](#)  
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