

# DARIUS FOO

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## RESEARCH INTERESTS

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Program logics, automated verification, distributed systems

## EDUCATION

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### National University of Singapore

PhD in Computer Science, under Graduate Tutorship-PhD Scheme

2020 – Present

- Advisor: Wei-Ngan Chin; on automated verification of effectful higher-order programs
- Dean's Graduate Research Excellence Award, AY 2023/2024

### National University of Singapore

Bachelor of Computing (Honours) in Computer Science

2012 – 2016

## WORK EXPERIENCE

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### Senior Software Engineer

2016 – 2020

SourceClear, later Veracode by acquisition

- Worked on the SourceClear Agent, a tool which uses a combination of static analysis and instrumentation to discover and automatically upgrade library dependencies from CI/CD pipelines.
- Authored short papers on the following tools:
  1. **SGL** a domain-specific graph query language for representing security vulnerabilities.
  2. **Update Advisor** scalable static analysis for detecting breaking changes in auto library upgrades.
  3. **Sapling** optimizing story assignments for SAFe PI Planning using answer set programming.

## PROJECTS

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**Heifer** an automated verifier for effectful higher-order programs

**staged** a Coq formalisation of *staged logic*, the logic underlying Heifer

**Choreographic PlusCal** a choreographic specification language for  $TLA^+$

**ppx\_interact** interactive breakpoints via the OCaml toplevel à la pdb/pry

**ppx\_deriving\_unparse** derives *unparsing* functions, which render properly-parenthesised expressions

## PUBLICATIONS

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### Specification and Verification for Unrestricted Algebraic Effects and Handling

ICFP 2024

Yahui Song, [Darius Foo](#), Wei-Ngan Chin

### Staged Specification Logic for Verifying Higher-Order Imperative Programs

FM 2024

[Darius Foo](#), Yahui Song, Wei-Ngan Chin

### Protocol Conformance with Choreographic PlusCal

TASE 2023

[Darius Foo](#), Andreea Costea, Wei-Ngan Chin

### Automated Temporal Verification for Higher-order Algebraic Effects

APLAS 2022

Yahui Song, [Darius Foo](#), Wei-Ngan Chin

### Tracing OCaml Programs

OCaml 2022

[Darius Foo](#), Wei-Ngan Chin

## ACADEMIC SERVICE

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Programme Committee

OCaml 2025

Subreviewer

CAV 2022, POPL 2022, TASE 2024

Artifact Evaluation Committee

ESOP 2022

Student Volunteer

PLDI 2021, SPLASH 2022

## TEACHING

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Database Systems

2020, 2022, 2024 S1 & S2, 2025

Programming Methodology I & II

2013-2015, 2021-2023

Software Engineering

2016, 2022