

DARIUS FOO

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RESEARCH INTERESTS

Program logics, automated verification, distributed systems

EDUCATION

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

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

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

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

Programme Committee

OCaml 2025

Subreviewer

CAV 2022, POPL 2022, TASE 2024

Artifact Evaluation Committee

ESOP 2022

Student Volunteer

PLDI 2021, SPLASH 2022

TEACHING

Database Systems

2020, 2022, 2024 S1 & S2, 2025

Programming Methodology I & II

2013-2015, 2021-2023

Software Engineering

2016, 2022