GAVIN GRAY

PROVIDENCE, RI

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PUBLICATIONS

OOPSLA '23 **A Grounded Conceptual Model for Ownership Types in Rust.**
Will Crichton, *Gavin Gray*, Shriram Krishnamurthi.

HATRA '23 (workshop) **Debugging Trait Errors as Logic Programs.**
Gavin Gray, Will Crichton.

EDUCATION

May. '24 **ETH Zürich**, *M.Sc. in Computer Science*.

May '21 **University of Utah**, *B.Sc. in Computer Science*.

- Cumulative GPA: 4.0 / 4.0 *(Summa Cum Laude)*
- Outstanding undergraduate award

EXPERIENCE

Jun. '23—Aug. '23 **Brown University**, *Researcher*.

- Researched techniques to debug trait-related errors in Rust via *partial proof trees*. Implemented tracing and proof tree construction in the Rust trait-solver.
- Advised by Will Crichton and Shriram Krishnamurthi in the Brown PLT group.

Jun. '22—Sep. '22 **ETH Zürich**, *Researcher*.

- Spearheaded the memory-safety verification of the Scion router prototype. Identified and fixed two memory vulnerabilities using Gobra, an automated verifier for Go.
- Advised by João Pereira and Peter Müller in the Programming Methodology Group.

Jun. '21—Aug. '21 **Goldman Sachs**, *Summer technology analyst*.

- Integrated *Access Fintech* into the GS reconciliation platform using Java, Kafka, and Pure. Reduced human actions by 40% and increased data availability across business units.

Jun. '20—Aug. '20 **Epic Systems**, *Software engineering intern*.

- Implemented and tested various metrics to determine physician similarity, then deployed a suggested physician engine into the *Epic Earth* platform using C#, Python, and Flask.

Aug. '19—May '21 **University of Utah School of Medicine**, *Research assistant*.

- Improved radio communication stability for the *wireless ranging enabled node* (WREN) network by 13% using nesC and distributed consensus algorithms.

TEACHING

Fall '22—'23 **Concepts of Object-Oriented Programming**, ETH Zürich (2x).

Spring '22 **Data Modeling and Databases**, ETH Zürich.

Spring '21 **Database Systems**, University of Utah.

Spring '20—'21 **Software Practice**, University of Utah (2x).

Fall '17—'18 **Digital Circuits**, Utah State University (2x).

SKILLS

Functional programming: Lisp, Racket, OCaml.

Systems programming: C, C++, Rust.

Web development: TypeScript, React, HTML, CSS.

Research interests: PL design, compilers, formal methods, human-computer interaction.

Language: English (native), Portuguese, German.

PROJECTS

Argus | *Rust*

- Implemented a compiler plugin and VSCode IDE extension to facilitate debugging Rust trait errors.

Aquascope | *Rust*

- Implemented a compiler plugin to automatically generate visualizations of Rust ownership types. Deployed online in *The Rust Book Experiment* used by 50,000+ Rust learners.

High-performance OPUS Framework | *C*

- Engineered an implementation of the *Optimization by Particle swarm Using Surrogates* (OPUS) framework achieving a 4% (flop/cycle) speedup over existing implementations.

The Barrelfish Operating System | *C*

- Personally implemented memory allocation, paging, and device drivers for the team OS.
- Implemented a 32bit version of PicoLisp and corresponding shell program allowing OS extensibility.

Multi-core Parallel Ripple Search | *C++*

- Achieved a 3.75% performance (flop/cycle) increase compared to optimized implementations of the *Parallel Ripple Search* pathfinding algorithm.

GScheme | *OCaml*

- Impelemented a subset of the R^6RS Scheme specification emphasizing hygienic macro expansion.

AHJ Registry | *Django, MySQL, Vue.js*

- Bachelor's thesis project, now maintained by Sunspec Alliance. Interactive databank that facilitates the process of obtaining a construction permit in the USA.

Prusti | *Rust*

- Open source contributions to Prusti, a Rust verification tool developed at ETH Zürich.
- Developed a command-line configuration layer to override configuration settings at run time.

FFmpeg Audio Codec & Format | *C*

- Integrated the muxer/demuxer of a simple file format, *asif*, into FFmpeg.

AWARDS

2021 UoU-Computer Science Outstanding Undergraduate Award

2020 Robert Henricks Scholarship

2019 University of Utah Flagship Scholarship

2017 American Nuclear Society Sophomore Scholarship

2017 ASUSU Sophomore Scholarship

2016 Utah State University Aggie Merit Scholarship

2016 Utah State Regents' Scholarship