

Adam T. Geller

PHD STUDENT IN COMPUTER SCIENCE WITH A FOCUS ON PROGRAMMING LANGUAGES

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*I am broadly interested in research related to **compilers** and **type systems**. My work focuses on using type systems within compilers to perform safe optimizations.*

Education

University of British Columbia (UBC)

PH.D. IN COMPUTER SCIENCE (IN PROGRESS)

Supervisor: William J. Bowman

Vancouver, Canada

2020 - Ongoing

University of British Columbia (UBC)

M.SC. IN COMPUTER SCIENCE

Thesis: *An Indexed Type System for Faster and Safer WebAssembly* (doi: [10.14288/1.0392977](https://doi.org/10.14288/1.0392977))

Co-Supervisors: William J. Bowman, Ivan Beschastnikh

Vancouver, Canada

2018 - 2020

University of Washington (UW)

B.SC. IN COMPUTER SCIENCE AND ENGINEERING

GPA: 3.63

Dean's List, Fall 2017, Winter 2018, Spring 2018

Annual Dean's List, 2017-2018

Seattle, United States

2016 - 2018

Papers

Indexed Types for Statically Safe WebAssembly

ADAM T. GELLER, JUSTIN FRANK, WILLIAM J. BOWMAN

POPL 2024

DOI TBA

Flux: Liquid Types for Rust

NICO LEHMANN, ADAM T. GELLER, NIKI VAZOU, RANJIT JHALA

PLDI 2023

[doi: 10.1145/3591283](https://doi.org/10.1145/3591283)

Verifying that web pages have accessible layout

PAVEL PANCHEKHA, ADAM T. GELLER, MICHAEL D. ERNST, ZACHARY TATLOCK, AND SHOAB KAMIL

PLDI 2018

[doi: 10.1145/3192366.3192407](https://doi.org/10.1145/3192366.3192407)

Research Experience

University of British Columbia

GRADUATE RESEARCH ASSISTANT

My current research project is building an indexed type system for WebAssembly to improve compiler optimizations. As part of this project, **I designed the indexed type system, designed a framework for using it to perform compiler optimizations, and implemented both the type system and said optimizations.** In addition, **I proved the type safety of the type system and optimizations, and performed an evaluation** to see how much speed-up is attainable through these optimizations.

2018-Current

Vancouver, Canada

IMDEA Software Institute

RESEARCH INTERNSHIP

I had a 4-month research internship at IMDEA supervised by Niki Vazou where I worked on the Flux project. **I worked on verifying Rust programs using both Prusti and Flux to perform a comparison between the two.** I also assisted with testing Flux, and developed support for a few operators in Rust. During this project, I learned about the structure of the Rust compiler.

Jan-May 2021

Madrid, Spain

Max Planck Institute for Software Systems

RESEARCH FELLOWSHIP

During my 3-month research fellowship at the MPI-SWS working with Maria Christakis, I worked on a software testing project that combined fuzz testing with dynamic symbolic execution. **I implemented an experimental tool and built existing systems specially to work with the tool, which I then used for preliminary experimentation.**

May-Aug 2019

Kaiserslautern, Germany

University of Washington

April 2017-June 2018

UNDERGRADUATE RESEARCH

Seattle, United States

For five quarters during my undergrad at UW, I was one of the developers in a research group in the Programming Languages and Software Engineering group at the University of Washington working on The Cassius Project, (cassius.uwplse.org).

I helped develop formal semantics for CSS floating elements based on the CSS informal specification and used them to write tests in Z3 to ensure that the specification is met for valid inputs. **I added support for reasoning about various CSS features**, and extended the framework's treatment of text boxes by generating constraints based on font metrics. In addition to adding features to Cassius, **I also wrote a test-case minimizer** to assist in the debugging of Cassius.

Talks

Wasm-prechk

2023

PNW PLSE

I presented my in-progress work on the indexed type system for WebAssembly in a lightning talk as part of PNW PLSE 2023 (Pacific Northwest Programming Languages and Software Engineering).

An Indexed Type System for Fast and Safe WebAssembly

2020

SOIL SEMINAR

[Recording and More Information](#)

I presented my in-progress work on the indexed type system for WebAssembly as part of the SOIL Seminar series.

Other Experience

University of British Columbia

2018,2021-2023

GRADUATE TEACHING ASSISTANT

Vancouver, Canada

Two terms of CPSC 411, Intro to Compiler Construction (2021,2023)

One term of CPSC 310, Intro to Software Engineering (2020)

One term of CPSC 416, Distributed Systems (2018)

USA Fencing/Canadian Fencing Federation

2010-Ongoing

FENCING REFEREE

United States and Canada

I am a national Fencing referee (with up-to-date SafeSport clearance) with USA Fencing. I have refereed at local, regional, and national tournaments within the US and Canada, refereed events at every level and age group. As a referee, I have learned valuable leadership skills such as communication, teamwork, making tough decisions under pressure, and maintaining control in tense situations.

I have also been a head referee at several regional tournaments within the US. As a head ref, my role is to manage and organize the referees, handle complaints, and ensure the smooth running of the tournament as a whole.