

JASPER GEER

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EDUCATION

University of British Columbia <i>Vancouver, British Columbia, Canada</i> Computer Science, PhD	<i>2024-Present</i>
Tufts University <i>Medford, Massachusetts, USA</i> Computer Science, BS <i>summa cum laude</i>	<i>2020-2024</i>
• Supervised by Dr. Alexander J. Summers	
Mercer Island High School <i>Mercer Island, Washington, USA</i>	<i>2016-2020</i>
• Activities: TuPL Reading Group, Tufts Chinese Students' Association Event Chair 2022-23	

RESEARCH EXPERIENCES

Tufts Programming Languages (TuPL) , Tufts University <i>Research Assistant</i>	<i>September 2023 - Present</i>
• Conducted program synthesis research under Professor Jeff Foster.	
• Worked on the implementation of a novel constraint-guided Java program synthesis technique.	
Tufts Security and Privacy Lab , Tufts University <i>Research Assistant</i>	<i>September 2023 - May 2024</i>
• Assisted in a review of recent symbolic execution literature under Professor Dan Votipka.	
• Qualitatively coded rounds of 5-10 research papers and contributed to codebook development.	

PROFESSIONAL EXPERIENCES

Tesla <i>Vehicle Software Intern</i>	<i>May 2023 - August 2023</i>
• End-to-end feature development in Haskell for an incremental compiler frontend.	
• Refactored compiler passes into incremental build rules for a monadic build system.	
• Created embedded domain-specific languages to implement new language server features.	
• Received offer for full-time conversion.	

TEACHING

University of British Columbia, Graduate Teaching Assistant	<i>September 2024 - Present</i>
• CPSC411, Compilers. <i>Spring 2024</i> .	
• CPSC311, Definition of Programming Languages. <i>Fall 2024</i> .	
Tufts University, Teaching Fellow	<i>January 2024 - May 2024</i>
• CS170, Computation Theory. <i>Spring 2024</i> .	
Tufts University, Course Assistant	<i>September 2022 - December 2023</i>

- CS170, Computation Theory. *Fall 2022*.
- CS170, Computation Theory. *Spring 2023*.
- CS170, Computation Theory. *Fall 2023*.

Coding With Kids

May 2022 - September 2022

- Taught week-long programming classes for middle and elementary school students.

The Summit at Snoqualmie

Nov 2018 - March 2021

- Taught 8-week long nordic skiing youth programs.

AWARDS

Four Year Doctoral Fellowship (4YF), University of British Columbia

Jan 2026 - Dec 2029

PROJECTS

miniVerifier

- Symbolic-execution based verifier for a small programming language with Hoare-logic specifications.
- Written in Haskell and produces SMT-LIBv2 scripts.

Compost

- LLVM frontend for a statically-typed functional programming language.
- Designed an affine type system to enforce memory safety without runtime garbage collection.
- Began as a personal summer project, completed as a semester-long group project in a compilers class.
- Written in OCaml.

tinyValidator

- Translation validator for a C-subset language by means of symbolic execution.
- Devised a big-step operational semantics to describe the execution of programs with symbolic inputs.
- Written in Haskell and uses the Z3 SMT solver.

PROGRAMMING BACKGROUND

- Recent Experience with Haskell, Scala, and Rust.
- Some experience with OCaml, SML, Racket, C, Typescript, Python, and Java.