

## Education

*Master of Science*, Oregon State University, Computer Science - Completed June 2022 • **4.0 GPA**

*Bachelor of Science*, Oregon State University, Major: Computer Science | Minor: Mathematics - Completed June 2020 • **4.0 GPA**

## Skills

*Programming Languages*: C, C++, Haskell, Elm, Coq, Idris, Crystal, JavaScript, TypeScript, Kotlin, Java, Python, Nix, Haxe

*Languages*: English (native), Russian (native), French (conversational, DELF B1 certification)

*Additional Skills*: Compiler design, formal verification, algorithms, low-level development.

## Projects

bloglang [↗](#) — Compiler for a purely functional, lazily evaluated language explained in-depth on [personal blog](#).

maypop [↗](#) — Dependently typed functional programming language capable of formal proofs.

pegasus [↗](#) — LALR parser generator currently supporting the C and Crystal languages.

matrix-highlight [↗](#) — Tool for collaborative, decentralized, and federated web annotation based on the Matrix protocol.

## Publications

Divya Bajaj, Martin Erwig, **Daniel Fedorin**: *A Visual Notation for Succinct Program Traces (journal paper)*, COLA 2023

Divya Bajaj, Martin Erwig, **Daniel Fedorin**, Kai Gay: *Adaptable Traces for Program Explanations*, APLAS 2021

Divya Bajaj, Martin Erwig, **Daniel Fedorin**, Kai Gay: *A Visual Notation for Succinct Program Traces*, VL/HCC 2021

Jácome Cunha, Mihai Dan, Martin Erwig, **Daniel Fedorin**, Alex Grejuc: *Explaining spreadsheets with spreadsheets (short paper)*.  
GPCE 2018: 161-167

## Work Experience

Programming Language Engineer, Chapel [↗](#)

Hewlett Packard Enterprise | Summer 2022 - Present

- Added support for compile-time reflection, various language keywords, and full scope resolution to compiler written in **C++**.
- Designed and implemented a **type-safe error reporting API**, improving developer experience and compiler error messages.
- Enabled rapid prototyping of language tooling such as linters by developing **Python** bindings for compiler front-end.
- Supported community growth by designing, launching, and authoring articles for the [Chapel language technical blog](#).
- Laid groundwork for compatibility with leading-edge supercomputers by implementing initial **AMD GPU programming support** using **Clang** and **ROCm** tooling.

Research and Teaching Assistant, Programming Language Theory

Oregon State University, Corvallis, OR | Spring 2018 - Summer 2022

- Formalized denotational and operational semantics of new **explanation-oriented programming languages**.
- Developed tooling in **Haskell** to interpret, verify, generate, and debug programming languages.
- Contributed to **research papers** published to the GPCE and VL/HCC.
- Proctored **quizzes and exams** for over 200 students.
- Aided students in implementing a final project in the form of a **custom programming language**.
- Suggested and organized **independent review sessions** attended by over 70 students, with 50% attendance growth between sessions.

Front-End Intern, Hydrogen [↗](#)

Element.io | June 2021 - September 2021

- Spearheaded migration of codebase to **TypeScript**, improving documentation and discovering hidden bugs.
- Leveraged advanced type system features to precisely specify nontrivial program properties.
- Developed a mocking system to help specify and test corner cases in a **distributed communication system**.
- Independently implemented user-facing features including offline-first replies and sanitized HTML rendering.

## Additional Experience

Technical Writer

Independent | Spring 2015 - Present

- Designed and published website currently live at [danilafe.com](#).
- Authored blog posts on topics spanning data structures, web development, programming languages, and compilers.
- Formalized and described solutions to select Advent of Code problems using the **Coq proof assistant**.
- Created **14-part series** on compiler development, walking readers through lexing, parsing, compilation using LLVM, garbage collection, and polymorphic type checking.