

# Daniel Fedorin

🏠 Corvallis, OR

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## Education

*Bachelor of Science*, Oregon State University, Major: Computer Science | Minor: Mathematics - Completed June 2020 • **4.0 GPA**  
*Master of Science*, Oregon State University, Computer Science - Expected June 2022 • **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 [🔗](#) — Instructional implementation of a 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**, 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

Research Assistant, Programming Language Theory  
Oregon State University, Corvallis, OR | Spring 2018 - Present

- Formalized denotational and operational semantics of new **explanation-oriented programming languages**.
- Devised and implemented language to explain behavior of spreadsheets to new users.
- Developed tooling in **Haskell** to interpret, verify, generate, and debug programming languages.
- Contributed to **research papers** published to the GPCE and VL/HCC.

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.
- Engaged in **open-source development**, interacting with community to respond to bug reports and feature requests.

Undergraduate Teaching Assistant, Programming Language Theory, CS 381

Oregon State University, Corvallis, OR | Winter 2020 - Spring 2020

- Engaged in weekly question-and-answer sessions regarding course topics.
- Aided students in implementing a final project in the form of a **custom programming language**.
- Proctored **quizzes and exams** for over 200 students.
- Organized **independent review sessions** attended by over 70 students.

## 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.

Lead Programmer

Northwest Advanced Programming Workshop, Portland, OR | Summer 2017

- Led a small team using the **git version control system**.
- Designed and implemented a **desktop calculator** application with a focus on usability and feature-completeness.
- Worked on a variety of components, including parsing input through a custom regular expression engine, evaluating expressions through Taylor Series, and UI design.
- Profiled and debugged application using **VisualVM** in order to find inefficiencies, reducing computation time by 60%.

## Honors and Awards

- *Drucilla Shepard Smith Award* — Awarded to students maintaining a GPA of 4.0 while attending Oregon State University.
- *Honor Roll (all terms)* — Awarded to students maintaining a full credit load and a GPA above 3.5.
- *Finalist* — Google Code-In 2016, online competition in which participants complete tasks for open-source projects.