

Nathan Lilienthal

nathan@nixpulvis.com ◦ <https://nixpulvis.com> ◦ +1-202-701-4368

Languages: Rust, Java, Ruby, C/C++, LUA, Racket, Shell. Java/Typescript, Python, and more...

Systems: UNIX, Linux, Git + Hub/Lab, Rails, Heroku, Postgres (PostGIS), SQLite, AVR/ARM, WoW (ask me about it).

Professional Experience

- **Action Inc.** **Remote / Boston, MA**
Software Developer *Nov. 2021 – Sept. 2022*
 - Developed a standalone Java tool to assist with templated spreadsheet population for science team deliverables, which is being integrated with the main web platform
 - Profiled and optimized core platform routines, as well as contributed to broader efforts to design new architecture around efficiently running our large analytic jobs
 - Updated, fixed, and initiated work on large portions of the platform developer documentation, as well as user guides and UX issues
 - Handled production bugs as they came in as the primary point of contact and technical lead during the investigations
- **Northeastern University** **Boston, MA**
Research Programmer, Intelligence Advanced Research Projects Activity, HECTOR *Aug. 2019 ~ May 2021*
 - Collaboratively developed a hybrid-mode secure programming language design for multi-party computation (MPC)
 - Represented my team at both remote and in-person technical exchange meetings with other researchers
 - Built a prototype implementation of our language, which is forked from the Rust programming language
 - Began a formalism for our language(s), which will include sound typing rules, and reductions
- **Forward Financing Inc.** **Boston, MA**
Sr. Software Engineer *May 2018 – Aug. 2019*
 - Developed a client wrapper for an Algolia search implementation
 - Quickly performed various application performance improvements, often caused by unacceptable response times
 - Planned architecture refactoring, including object model improvements and a new data permissions system
 - Led efforts to create an orchestration CLI for managing a complex Heroku + Salesforce microservice system
 - Mentored co-op university students by providing deep code reviews and pair programming
- **HOMER Energy** **Boulder, CO**
Software Developer, Summer Intern *Summer 2012, Jul. 2017 - Nov. 2017*
 - Built API integrations for the HOMER C# application, including REST and CSV file APIs which involved a general refactoring of the code which imports data, complete with added tests
 - Developed an internal tool to view the Google Protocol Buffer used to pass values between all parts of the application allowing developers to quickly see inputs and outputs
 - Created a web-based frontend for HOMER in Rails, which served at the starting point for another version and provided a proof of concept for how to integrate the HOMER API with a webserver
- **Apple Inc.** **Cupertino, CA**
Software Engineer – Full-time Coop & Full-time *Jan. 2015 – Aug. 2015, Jul. 2016 – Jul. 2017*
 - Built a Ruby library (**radic**) and CLI (**radish**) for interacting with Apple's bug management system (aka Radar)
 - Participated in a cross-cutting web design work group to help create common components for the hardware teams
 - Contributed to an internal tool for managing hardware validation, inspired in part by Travis CI
 - Contributed to an internal tool for analysing large amounts of pre-production device test data
- **Americas Test Kitchen** **Boston, MA**
Web Developer – Full-time Coop *Jan. 2014 – June 2014*
 - Pushed code to the frontend and backend for all four Americas Test Kitchen websites, including bug fixes and technical infrastructure upgrades
 - Built modularized components to abstract functionalities found common throughout the company's codebase
- **Bluesocket - Adtran** **Burlington, MA**
Software Developer – Full-time Coop *Jan. 2013 – June 2013*
 - Developed an automated build system, which reduced turnaround time by allowing anyone to easily run a build
 - Addressed user reported issues in Ruby/Rails and LUA, including hardening validations and updating database migrations for old versions of the software
 - Designed a class/model structure for users and accesspoints, which allowed the backend to represent clients of individual accesspoints

Education & Projects

- **Northeastern University**

Boston, MA

2011 – 2016

College of Computer and Information Science

Bachelor of Science in Computer Science

- **Relevant Courses:** Programming Languages, Special Topics in Programming Languages, Compilers, GPU Programming & Architecture, Systems and Networks, Computer Organization, Software Development (aka HELL), Theory of Computation, Algorithms and Data Structures, Fundamentals of Computer Science 1 & 2, Object Oriented Design, Artificial Intelligence, Logic and Computation, Combinatorics.
- **Clubs & Extracurriculars:** Association for Computing Machinery, NU Hacks, Hack Beanpot.

Teaching Assistant, Fundamentals of Computer Science 1

Fall of 2012, 2013, 2014, and 2015

- Conducted short lectures before each lab and then lead the lab's students and tutors in the weekly assignments
- Discovered new ways to present concepts that facilitated student understanding
- Assisted students at established office hours and online
- Participated and lead course administrative tasks, including grading, meta-grading, testing, rubric development, and weekly teaching staff meetings

Independent Study

Spring 2014

A Heterogeneous System Simulator

<http://www.multi2sim.org>

- Investigated caching protocols, including MOSI and MOESI, along with our own data dependency analysis
- Developed needed base classes for use with the LLVM to Southern Islands backend
- Fixed a register release bug in the OpenCL to LLVM pipeline

- **Notable Projects**

<https://github.com/nixpulvis>

- `alacrity`, a cross-platform, GPU-accelerated terminal emulator (contributor)
- `oursh`, a multi-language shell which aims to be POSIX compatible, written in Rust
- `lalrpop-lambda`, parser and reductions for the lambda calculus with a minimal webapp
- `parser-combinator`, a Racket implementation of a recursive descent parser, used by students for a JSON lab
- `galos`, an Elite: Dangerous EDDN subscriber, (PostGIS) database, CLI, and GUI
- `nrf24l01`, basic working AVR firmware for the Nordic Semiconductor's nRF24L01+ radio transceiver
- `maze_gl`, a small maze generation and first person OpenGL game

Other Interests: Microelectronics, Music, Woodworking, Billiards, Environmentalism, Travel & Culture, Gaming, Skiing, Frisbee, Cats, and much more ...

```

(λ(f) (λ
(x) ((x(λ(
x) (λ(x y)y)
) (λ(x y)x) (
x(λ(x) (λ(x y)
y)) (λ(x y
)x) ((
x(λ(p) (
λ(s) (s
(p (λ(
x y)y))
(λ(f x
) (f(p(
λ(x y)
y)) f x
)))))) (
λ(s) (s(
λ(f x)x)
)) (λ(x y)
x)) (λ(x) (λ(
x y)y)) (λ(
x y) x)) (λ(
f x) (f x)) ((f
(x(λ(p) (λ( s
) (s(p( λ(x y)
y)) (λ( f x) (f(
p (λ( x y)y)
) f x)) )) (λ(
y s) (s
) x) (λ(
)) (λ(
) (λ(n)
x) (f (n
) (f(((
λ(s) (s
x y )y
x) (f((
)y) f
) (λ(s) (
)x) (λ(
)) (λ
)) (λ(p
s(p(λ(
) (λ( f
x) (f
(f x)x)
x y)x)
))))))
(λ(s) (
x) (λ(
))) (λ(
))))))

```