Nathan Lilienthal

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Research Interests: Programming languages, multi-language embedding, multiparty computation, type systems (including refinement and graded types), contracts and blame, security and safety, compilers, complexity theory, communication networks, and lambda calculi.

Education

- **Northeastern University** **Boston, MA**
  College of Computer and Information Science *2011 – 2016*
  Bachelor of Science in Computer Science
  - **Relevant Courses**: Programming Languages, Special Topics in Programming Languages, Compilers, 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.
- **Projects** `https://github.com/nixpulvis`
  - `alacritty`, 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
  - `brainfuck`, a complete and reasonably performant BF interpreter
  - `nrf24l01`, basic working AVR firmware for the Nordic Semiconductor's nRF24L01+ radio transceiver
  - `maze_gl`, a small maze generation and first person OpenGL game

Research Experience

- **Northeastern University** **Boston, MA**
  Research Programmer, Intelligence Advanced Research Projects Activity, HECTOR *Aug. 2019 – Aug. 2020*
  - 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

Teaching Experience

- **Northeastern University** **Boston, MA**
  Teaching Assistant, Fundamentals of Computer Science 1 *Fall of 2012, 2013, 2014, and 2015*
  - Conducted mini-lectures, monitored class progress, and answered students' questions
  - Discovered new ways to present concepts that facilitated student understanding
  - Assisted students during established office hours

Professional Experience

- **Forward Financing Inc.** **Boston, MA**
  Sr. Software Engineer *May 2018 – Aug. 2019*
  - 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
  - Developed a client wrapper for an Algolia search implementation
  - Mentored the co-op university students by providing deep code reviews and pairing on problems
- **HOMER Energy** **Boulder, CO**
  Software Developer, Summer Intern *Jul. 2017 - Nov. 2017, Summer 2012*
  - 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 front-end 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 *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, which was 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 *Jan. 2014 – June 2014*
  - Pushed code to the front-end and back-end for all four Americas Test Kitchen websites, including bug fixes and technical infrastructure upgrades
  - Built modularized components to abstract functionalities found in common throughout the company's codebase

- **Bluesocket - Adtran** **Burlington, MA**
  Software Developer *Jan. 2013 – June 2013*
  - Developed an automated build system, which reduced turnaround time, 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 wireless accesspoints, which allowed the back-end to represent clients of individual accesspoints

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Programming Languages: Rust, Racket, Ruby, Shell, C/C++, LUA. ECMAScript (JS), Python, Java, and more...
Systems: UNIX / Linux, Git + Hub / Lab, Rails, Heroku, Postgres / SQLite, AVR / ARM, WoW (ask me about it).
Other Interests: Teaching, Microelectronics, Woodworking, Music, Gaming, Skiing, Cats, ...