Shon Feder

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Experience

Software Engineer → Technical Project Lead (from Dec 2022) | *Informal Systems* | Feb 2020 – Present

- Apalache, a symbolic model checker for TLA+, written in Scala:
  - Improved team development methods, including CI/CD, code review, and automated weekly releases.
  - Added support for concurrent verification requests and improved composability via a gRPC server using ZIO.
  - Made interface with the model checker more accessible via the Chai Python client.
  - Reduced error surface and improved the tool's composability via a unified configuration architecture.
- Quint, a more approachable, modern, and extensible specification language based on TLA+, written in TypeScript:
  - Improved the expressivity and correctness of quint specs by initiating the design of a novel effect system.
  - Championed sound semantics and consistent syntax in the language design and implementation.
  - Enabled formal verification of quint specs by designing and leading integration with Apalache via the gRPC server.
  - Maintained and extended ANTLR4 parser
- Designed and implemented themis-tracer, a prototype tool for specification and requirement tracing in Rust & SQLite.
- Organized and facilitated a working group to increase employee engagement with company governance.
- Served as Technical Project Lead for a team of amazing research engineers, supporting their work and wellbeing.

Software Engineer | *CareDox* | Mar 2019 – Aug 2019

- Collaborated on redesign of electronic health records platform using CQRS/ES architecture.
- Designed & implemented extensions to REST & GraphQL APIs for Elixir microservices using MySQL & PostgreSQL.

Software Engineer, Tools and Infrastructure | *Digital Asset* | Nov 2018 – Mar 2019

- Migrated snowflake Jenkins instance to infrastructure as code (IaC), using Terraform, NixOS, and JcasC.
- Implemented purely functional deployment and delivery in a globally distributed, polyglot development environment using NixOS, Hydra, Docker, and Terraform on GCP.
- Set up CI/CD for the Canton project, leveraging Scala Build Tool, Docker, and CircleCI.

DevOps Engineer → Robotics Automation Software Engineer | *KeyMe* | June 2016 – Nov 2018

- Designed and implemented interfaces for LED and GPIO firmware in C for an Atmega AVR MCU.
- Designed and implemented robotics calibration framework in Python to standardize reporting and improve reliability.
- Prototyped ports of core processes to Rust, OCaml, and Haskell, helping secure Haskell's introduction into production.
- Reduced ticket load by 50% through extensible Python framework I designed and developed to automate issue responses.
- Improved the speed (~20%), reliability, and flexibility of software deployments to thousands of linux nodes.
- Worked with Dev, Ops, Customer Service, and Technical Support to foster a culture of collaboration and communication.

Projects

um-abt: An OCaml library implementing unifiable abstract binding trees (UABTs)
emojitsu: CLI utility for bi-directional conversion between unicode emojis and their (GitHub) names
nomad: A minimalist project management tool for OCaml
estimation game: An fullstack OCaml web app used in academic research on educational psychology
tokenize: A simple tokenization library for (SWI-)Prolog
OCaml Outreachy Co-Mentor (Winter 2021): Helped support and mentor junior programmers as a volunteer
Select Volunteer OSS Contributions: dune (former member of development team), atd, vyconf, aws_ssm_provider, omd

Skills

Programming Languages: OCaml, Scala, Prolog, Python, TypeScript, JS, Rust, F*, TLA+, Haskell, Bash, SQL, Elixir
Software & Tooling: ANTLR4, Menhir | GCP, AWS | Emacs, Vim | Nix, Docker | GitHub Actions | Make, Dune, SBT | Postgres
Methodologies: functional, relational, object oriented, actor model | type-theoretic, algebraic, and model-based formal specification | requirements engineering, participatory design, build and release engineering

Education

Recurse Center, Brooklyn, NY — Sept 2019 – Dec 2020
Implemented typed lambda-calculi in my Themis project, studied category theory and the theory of ML modules

University of Colorado Boulder, Boulder, CO — 2010 – 2012
Towards an MA in German Language and Literature | Awarded the Max Kade Fellowship (2010)

University of Colorado Boulder, Boulder, CO — 2002 – 2007
BA in Philosophy