Trevor Elliott

Experience

2022-Present **Principal Engineer**, *Fastly*, Portland, OR.
Working on the Compute@Edge team

2019–2022 **Infrastructure Engineer**, *Stripe*, Portland, OR.
Working on the sorbet typechecker and compiler for ruby.

- Key contributor on the sorbet compiler, implementing optimizations and improving coverage for the ruby language. Generated native code with llvm, targeting the ruby vm's c api.
- Implemented type-system features and improved type-checker runtime performance.
- Mentored an intern on the sorbet compiler project, and organized/ran regular meetings with external contributors from other companies.

2017–2019 **Compiler Engineer**, *Groq, Inc.*, Portland, OR.
Worked on a compiler for tensorflow models, targeting a custom ASIC that accelerates inference. Focused on compiler performance and optimization of results.

2007–2017 **Engineer and Researcher**, *Galois, Inc.*, Portland, OR.
Contributed to a broad range of projects, notably:

- Developed domain specific languages in Haskell, including the msf-haskell metasploit DSL and the Ivory DSL for memory-safe embedded programming
- Developed and contributed to multiple full language implementations, including Cryptol and the Salty GR(1) reactive synthesis DSL
- Implemented the HaNS network stack
- Aided ASIC design and verification for lightweight cryptographic primitives from Cryptol specifications

2004–2007 **Developer**, *CollegeNET*, Portland, OR.
Helped to transition a large desktop application to a suite of web services, and developed tools based off of those web services. Also assisted with some front-end web development, and implemented an LDAP-based authentication system.

2002–2004 **Technical Support**, *CollegeNET*, Portland, OR.
Provided technical support to a large client base.

Education

2008 **B.S. Computer Science**, *Portland State University*, Portland, OR.

Open Source Projects

sorbet	The sorbet typechecker and compiler for ruby
cereal	Haskell library for fast binary format parsing/rendering
ivory	Haskell EDSL for memory-safe embedded programming
salty	Reactive synthesis DSL for GR(1) specifications
HaNS	A TCP/IP network stack implemented in haskell
Cryptol	DSL for implementation and verification of cryptographic algorithms
HaLVM	Port of the GHC runtime to the Xen hypervisor
llvm-pretty	An EDSL for generating textual llvm bitcode
huff	A fast-forward based classical planning EDSL

Skills

Languages haskell, c/c++, rust, java, javascript, fsharp, ocaml, python, ruby, lua, assembly (x86, arm), coq, isabelle/hol, shell scripting

Tools z3, smt-lib, lldb, gdb, bazel, gnu make, vim/neovim

Publications

2019 Elliott, Trevor, Mohammed Alshiekh, Laura R. Humphrey, Lee Pike, and Ufuk Topcu (2019). “Salty-A Domain Specific Language for GR(1) Specifications and Designs”. In: *2019 International Conference on Robotics and Automation (ICRA)*, pp. 4545–4551. DOI: `10.1109/ICRA.2019.8793722`.

2016 Pike, Lee, Pat Hickey, Trevor Elliott, Eric Mertens, and Aaron Tomb (2016). “Trackos: A security-aware real-time operating system”. In: *International Conference on Runtime Verification*. Springer, Cham, pp. 302–317.

2015 Elliott, Trevor, Lee Pike, Simon Winwood, Pat Hickey, James Bielman, Jamey Sharp, Eric Seidel, and John Launchbury (2015). “Guilt free ivory”. In: *ACM SIGPLAN Notices*. Vol. 50. 12. ACM, pp. 189–200.

2014 Hickey, Patrick C, Lee Pike, Trevor Elliott, James Bielman, and John Launchbury (2014). “Building embedded systems with embedded DSLs”. In: *ACM SIGPLAN Notices*. Vol. 49. 9. ACM, pp. 3–9.

Pike, Lee, Patrick Hickey, James Bielman, Trevor Elliott, Thomas DuBuisson, and John Launchbury (2014). “Programming languages for high-assurance autonomous vehicles”. In: *Proceedings of the ACM SIGPLAN 2014 Workshop on Programming Languages meets Program Verification*. ACM, pp. 1–2.

Ravitch, Tristan, E Rogan Creswick, Aaron Tomb, Adam Foltzer, Trevor Elliott, and Ledah Casburn (2014). “Multi-app security analysis with fuse: Statically detecting android app collusion”. In: *Proceedings of the 4th Program Protection and Reverse Engineering Workshop*. ACM, p. 4.

2011 McNamee, Dylan and Trevor Elliott (2011). “Secure Historian Access in SCADA Systems”. In: *Galios, White Paper*.

2010 Launchbury, John and Trevor Elliott (2010). “Concurrent orchestration in Haskell”. In: *ACM Sigplan Notices*. Vol. 45. 11. ACM, pp. 79–90.