

# MAT TRUDEL

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## Summary of Skills

**Core Competencies:** Spec implementation. API design. Plumbing of all shapes and sizes; the lower level the better.

**Languages & Platforms:** Daily drivers include Elixir, Objective C & Ruby. Less frequently used but still solid languages include C (user-land & MCU mostly, some kernel work), as well as Erlang, Scala & Swift. Rust neophyte. Working knowledge of a plethora of others to varying degrees.

**Tooling:** Deep experience working with & optimizing Postgres, Kafka & Redis. Experience managing & maintaining production build pipelines & deployments via Ansible, Chef & Docker, along with many other common tools and services (Linux & BSD).

**Networking:** Recently undertook implementation of a high performance socket acceptor & custom HTTP server including bespoke socket-level encryption. Have built non-production IP stacks from network drivers up to the application layer. 20+ years experience with more conventional production networking administration & concepts.

**Sundry Skills:** Extensive cryptography experience, both theory & practice. Great eye for domain design, well versed in product design, iteration & optimization. Comfortable wearing just about any hat within an organization. Can deliver a killer lesson, workshop or conference presentation. Journeyman EE & PCB design skills. Budding CNC fabricator.

## Experience

### Technical Lead, FunnelCloud Inc

Toronto — 2019-Present (previously on a part-time contract basis since 2014)

Jointly responsible for architecture and design of a globally successful automotive manufacturing execution system (MES). Implemented the majority of the product's near realtime data processing pipelines in an extraordinarily complicated domain using a variety of technologies including Elixir, Scala, Ruby, Kafka, Postgres and several others, with a focus on resilient processing of data to and from a variety of internal & external sources. Point person for all matters pertaining to profiling, performance and database optimization.

### Principal, Moshozen Inc

Toronto / Remote — 2012-2019

My own technology consultancy primarily servicing clients in the healthcare space including several of the largest hospitals in Canada. Full-service work consisted of iOS / backend app development (Objective C & Rails mostly, also Swift & HTML/JS), along with a healthy dose of product design, UI/UX work, and whatever else it took to get the job done. Deliverables consisted principally of research pilots & in-house affairs; samples of work available on request.

### Massive Health Inc

San Francisco — 2011

As the second hire of a small health-care related startup, my responsibilities ranged over the entire operation of the ship. During my tenure at Massive, we designed and built 'The Eatery', a consumer health app that went on to win numerous 'Best Of Category' awards in 2011. I was responsible for the development of the underlying iOS application platform (a ground-up

Objective C implementation of an HTML engine inspired by PhoneGap) as well as the backend server (Rails, with a number of statistics tools bolted on).

**Developer-At-Large, Well.ca**

Guelph, Ontario — 2010-2011

Initially, my role at Well.ca was to act as a literal incarnation of my title, poking around the edges of the existing product, exploring new technologies & platforms to help guide the long-term growth and strategy of the team. With the notion of DevOps emerging as a distinct role around this time, I came to lead the effort to modernize the management, operations and deployment of the company's production environment, at the time one of the largest e-commerce sites in Canada.

**Senior Technical Team Lead, Medical Device Informatics Group, Toronto General Hospital**

Toronto — 2005-2010

I was a manager-among-equals of a team of five developers responsible for implementing technology based clinical trials in both home and hospital based environments. Building everything from iOS applications (including one that garnered international news exposure) to highly specialized custom medical hardware to data-heavy clinical reporting tools exposed me to an absolutely dizzying number of technologies and honed my ability to keep several balls in the air into something of an art form. Our small team size & work load dictated a formal yet pragmatic workflow and a pathological approach to automation.

**Education**

**MASc, University of Waterloo**

Waterloo, Ontario — 2003-2005

Not being able to get enough of combinatorial optimization in the working world, I decided to undertake a MASc in Civil Engineering specializing in traffic modelling. My thesis work developed an original model for optimal scheduling of road maintenance operations taking into account road conditions, weather forecasts and traffic levels. This work was presented at the 2005 Transportation Research Board conference (the premiere stop on the North American civil engineering conference circuit), and has since been extended by subsequent graduate students in the department.

**BMath (Double Honours), University of Waterloo**

Waterloo, Ontario — 1997-2002

Beginning as a CS major, I took particular interest in cryptography, graph theory, and combinatorial optimization in upper years, leading me to pursue a second Honours degree in Combinatorics & Optimization in addition to my original CS major. I also took interest in OS theory (one of my fourth year projects was building an actually-useful multitasking OS on bare metal x86 as part of Waterloo's infamous 'trains course') and circuit design (taking several courses in the Electrical Engineering department, stopping just short of a minor).

**Recent Open Source Work**

**mtrudel/bandit:** A pure-Elixir Plug-centric HTTP server

**mtrudel/thousand\_island:** Massively scalable pure-Elixir socket server

**mtrudel/hap:** A HomeKit Accessory Protocol (HAP) implementation for Elixir & Nerves

**SchedEx/SchedEx:** Powerful & idiomatic task scheduling for Elixir

## Publications & Presentations

“Bandit on the Loose! Networking in Elixir Demystified”. ElixirConf. Oct 2021. <https://www.youtube.com/watch?v=ZLjWyanLHuk>

“Much Nerves - A Hello World For the Embedded World”. Toronto Elixir Meetup. Jul 2020. <https://github.com/mtrudel/talks/blob/master/2020-07-Toronto-Elixir-Night-Nerves.pdf>

“Thousand Island - A pure Elixir socket server”. Toronto Elixir Meetup. Jan 2020. <https://github.com/mtrudel/talks/raw/master/2020-01-Toronto-Elixir-Night-Thousand-Island.pdf>

“Timers in the VM, SchedEx, and Factory Automation”. Elixir Talk Episode 120. June 2018. <https://soundcloud.com/elixirtalk/episode-120-feat-mat-trudel-timers-in-the-vm-schedex-and-factory-automation>

“mix new beats: Recreating the ‘Amen Break’ with Elixir”. EMPEX NYC. May 2018. <https://www.youtube.com/watch?v=XN4WuOujr38>

“Introducing SchedEx”. Toronto Elixir Meetup. Apr 2018. <https://github.com/mtrudel/talks/tree/master/2018-04-Toronto-Elixir-Night-SchedEx-Demo>

Lopez R, Chagpar A, White R, Hamill M, Trudel M, Cafazzo J, Logan AG. “Usability of a Diabetes Telemanagement System”. J Clinical Engineering. 2009; 34(3):147-151

Logan AG, McIsaac WJ, Tisler A, Irvine MJ, Saunders A, Dunai A, Rizo CA, Feig DS, Hamill M, Trudel M, Cafazzo JA. “Mobile phone-based remote patient monitoring system for management of hypertension in diabetic patients”. Am J Hypertens. 2007; 20(9): 942-8

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Fu, L, Trudel, M. “A Real-Time Scheduling Model for Winter Road Maintenance Operations”. Proceedings of the 84th Annual Meeting of the Transportation Research Board. Washington DC. January 2005