

Nathan Taylor

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Education

2021-???? **The University of Texas** Austin, TX

PhD, Computer Science | Supervisor: [James Bornholt](#)

Pondering the intersection of formal methods and concurrent and distributed systems.

2009-2012 **The University of British Columbia** Vancouver, BC, Canada

Msc, Computer Science | Supervisor: [Andy Warfield](#)

As a student in the [Network, Systems, and Security lab](#), I've contributed to the [Plastic](#) memory remapping framework, the [Tralfamadore](#) execution analysis system, and the [Revealthu](#) anonymous text classification system.

For UBC's brand-new [Scheme-based introductory CS course](#), I taught lab sessions, held scheduled office hours, and graded assignments and exams. On occasion, I lectured during instructor absences. For my work I was awarded a [graduate TA award](#) by the University (a [gold star!](#)).

I served as President of the [CS Graduate Students' Association](#) where I acted as the primary liason between the graduate student body and the department. I led the new student orientation organization, co-taught the departmental TA training sessions, organized various graduate [social activities](#), and represented the department on the [UBC Graduate Council](#).

2005-2009 **The University of Alberta** Edmonton, AB, Canada

Bsc, Computing Science

I served for two years on the [Undergraduate Association of Computing Science](#) executive, which interfaced with groups outside the department and advocated for undergraduates' issues within.

As a member of the U of A's [Cluster Challenge Team](#), I configured, benchmarked, and tuned the GAMESS quantum chemistry package, and served as a subject matter expert for the team. I also assisted with stereo 3D visualization of molecular data, and general system administration.

Industrial Experience

2020-2020 **Microsoft Research** Edmonton, AB, Canada (remote)

Contract Software Developer

Working remotely with the [AI for Systems](#) research group, I helped build *Shapeshifter*, which leverages machine learning and dynamic analysis to improve datastore index structure performance. Made key contributions to high-level system design, core implementation, and performance tuning. Additionally, I implemented an interactive [frontend](#) to the system as part of a [TechFest](#) demo for senior leadership.

2018-2019 **Apple** Cupertino, CA

Systems Software Engineer

I [brought the rainbow to you](#) by bridging the gap between hardware and software, influencing performance improvements, power efficiency, security, and the programming ease of hitherto-unreleased Apple products.

2017-2018 **Fauna** San Francisco, CA

Software Engineer

I worked on Fauna's [globally consistent, transactional database](#). Co-designed a distributed fault injection system to validate correctness under chaotic scenarios, such as network failures and database sharding changes. Mentored engineers coming up to speed with Scala and the FP programming style. Represented Fauna by giving internal tech talks and [writing company blog posts](#).

2014-2017 **Fastly**

San Francisco, CA

Senior Software Engineer

I maintained the [HTTP cache](#) that served upwards of [three million RPS](#) of traffic, and implemented new language features in Fastly's [configuration language](#). Designed and implemented a sandboxed dynamic analysis and system introspection platform, atop which the compiler, API, and security teams have built custom tooling. Represented Fastly by [speaking](#) at [conferences](#).

2012-2014 **Twitter**

San Francisco, CA

Software Engineer

In the [Runtime Systems org](#), I extended Twitter's Ruby and Java runtimes, improving garbage collection, JIT compilation, and VM tooling and infrastructure. Collaborated with service owners to debug GC and application-level performance issues in production systems. On the [Anti-Spam Engineering Team](#), I revamped and replaced multiple legacy spam detection systems, and designed and implemented services for user spam reporting and actioning. Served on on-call rotations.

Teaching Experience

For more details about my teaching experience and philosophy, please see [this page](#).

2020-2021 **MacEwan University**

Edmonton, AB, Canada

Sessional Instructor

As a [sessional instructor](#) for the 2020-2021 school year, I taught [CMPT 201: Programming Methodology](#) (the intro-to-C class) and [CMPT 220: Unix, Scripting, and Other Tools](#), the latter of which I redesigned mostly from scratch. I also taught the lab sections for CMPT 360: Introduction to Operating Systems.

2020-2020 **The University of Toronto**

Edmonton, AB, Canada (remote)

Sessional Instructor

Taught [CSC324: Principles of Programming Languages](#), during the Summer 2020 semester. Developed synchronous and [asynchronous](#) lecture material, assignments, and exams. Managed the staff of undergraduate and graduate TAs.

Publications and Presentations

- 01.2020 **ELF off the Shelf** | Unix-focused guest lecture in [Macewan University's OS class](#) | [Slides](#)
- 11.2017 **Cache Ruins Everything Around Me!** | Guest lecture in [Macewan University's OS class](#) | [Slides](#)
- 07.2017 **Let's Build A HyperCard RPG!** | Coding Livestream | [Videos](#)
- 11.2016 **Hands-on HTTP/2, a Fresh Start to The Web** | QCon SF 2016 | [Event Page](#)
- 06.2016 **Beyond Breakpoints: A Tour Of Dynamic Analysis** | QCon NYC 2016 | [Video](#) | [Materials](#)
- 12.2015 **Two Approaches towards OS Scalability** | Papers We Love SF 12/2015 | [Video](#) | [Event Page](#)
- 09.2015 **Racing to Win: Correct Concurrency with Race Conditions** | Surge 2015 | [Video](#) | [Materials](#)
- 04.2015 **Your Computer Is Already A Distributed System; Why Isn't Your OS?** | Papers We Love SF 04/2015 | [Video](#) | [Event Page](#)
- 06.2014 **Your Heap And You: Garbage Collector Tuning for Twitter Services** | Internal tech talk
- 05.2013 **Cachekata: Memory Hierarchy Optimization via Dynamic Binary Translation** | Msc. Thesis | [PDF](#)
- 04.2013 **Whose Cacheline is it Anyway: Operating System Support for Live Detection & Repair of False Sharing** | Eurosys '13 | [PDF](#)
- 03.2012 **Debugging Through Time with the Tralfamadore Debugger** | RESolve '12 | [PDF](#)
- 08.2011 **Herbert West: Deanonymizer** | HotSec'11 | [PDF](#)
- 10.2010 **Iodine: Interactive Program Partitioning** | OSDI '10 Poster Session | [PDF](#)