Nathan Taylor

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Education

The University of Texas   Austin, TX

PhD, Computer Science | Supervisor: James Bornholt

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

04.2013 **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.

04.2009 **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

2020-2020	**MacEwan University**	Edmonton, AB, Canada
	Sessional Instructor	

[Sessional instructor](#) for the 2020-2021 school year. Lab instructor and lecturer for CMPT 201: Practical Programming Methodology (the introductory C language class), and lab instructor for CMPT 360: Introduction to Operating Systems. Additionally, I redesigned and taught [CMPT 220: Unix, Scripting, and Other Tools](#), an introductory systems programming class.

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. Feedback from students included *"You are one of the best professors I had in three years at the UofT. Thank you for explaining the materials so well."*

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](#)