

Nathan Taylor

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Experience

2021-???? The University of Texas

Austin, TX

PhD student and Graduate Research Assistant | Supervisor: [James Bornholt](#)

Pondered the intersection of formal methods and computer systems. Organized the [Systems+PL](#) reading group and mentored students attending the undergraduate systems [directed reading program](#). Contributed to the [SquirrelFS](#) Rust persistent memory filesystem.

2020-2020 Microsoft Research

New York, NY (remote)

Contract Software Developer

Designed and implemented *Shapeshifter* with the [AI for Systems](#) lab, which leverages machine learning and dynamic analysis to optimize datastore index structure. Contributed to high-level system design, core implementation, and performance analysis. Built an interactive [visualizer and frontend](#) to the system as part of a [TechFest](#) demo for senior leadership.

2018-2019 Apple

Cupertino, CA

Systems Software Engineer

[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

Senior Software Engineer

Developed Fauna's core product, its [globally consistent, transactional database](#). Co-designed and implemented a distributed fault injection system to validate correctness under chaotic scenarios, such as network failures and database sharding changes. Mentored engineers new to Scala, JVM concurrency, and the strongly-typed functional programming style. Disseminated technical knowledge via the [official company blog](#).

2014-2017 Fastly

San Francisco, CA

Senior Software Engineer

Maintained Fastly's core product, an [HTTP reverse proxy and cache](#) during which traffic increased sixfold to [4.5 million RPS](#). Extended Fastly's [edge-compute programming language](#). Led the design and implementation of a sandboxing dynamic analysis and system introspection runtime, atop which the compiler, API, and security teams have built custom tooling. Represented Fastly externally by [speaking](#) at [conferences](#).

2012-2014 Twitter

San Francisco, CA

Software Engineer II

Extended Twitter's Ruby and Java runtimes as part of the [Runtime Systems org](#), 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. Revamped and replaced legacy spam and abuse systems as part of the [Anti-Spam Engineering Team](#), and designed and implemented services for user spam reporting and actioning.

Teaching Experience

For further details about my teaching experience and philosophy, please see [my homepage](#).

2020-2021 MacEwan University

Edmonton, AB, Canada

Sessional Instructor

2020-2020 The University of Toronto

Toronto, ON, Canada (remote)

Sessional Instructor

Education

2009-2012	The University of British Columbia	Vancouver, BC, Canada
	Msc, Computer Science Supervisor: Andy Warfield	
	As a TA for UBC's brand-new Scheme-based introductory CS course , I was awarded a graduate TA award by the University (a gold star!).	
	As President of the CS Graduate Students' Association , I liaised between graduate students and the department, led TA training sessions, organized social activities , and served on the UBC Graduate Council . Organized the systems and security reading seminars.	
2005-2009	The University of Alberta	Edmonton, AB, Canada
	Bsc, Computing Science	
	As a Undergraduate Association of Computing Science executive, I 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 physical chemistry domain expert for the team. I also assisted with stereographic visualization of molecular data and general cluster system administration.	

Publications and Presentations

07.2024	SquirrelFS: Using the Rust Compiler to Check Filesystem Crash Consistency	OSDI '24 PDF Source
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