

# Nathan Taylor

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## Experience

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### 2021-???? The University of Texas

Austin, TX

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

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

### 2020-2020 Microsoft Research

New York, NY (remote)

Contract Software Developer

Contributed to *Shapeshifter* with the [AI for Systems](#) lab, which leverages machine learning and dynamic analysis to improve datastore index structure performance. Contributed to high-level system design, core implementation, and performance analysis. Additionally 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 with Scala, Java concurrency, and the FP programming style. Represented the company at local meetups and [writing company blog posts](#).

### 2014-2017 Fastly

San Francisco, CA

Senior Software Engineer

Maintained Fastly's core product, the [HTTP cache and reverse proxy](#) that served upwards of [three million RPS](#) of traffic, and extended Fastly's [edge-compute programming language](#). Led the design and implementation of a sandboxing 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 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

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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

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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](#). Additionally, 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

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07.2024	<b>SquirrelFS: Using the Rust Compiler to Check Filesystem Crash Consistency</b>	OSDI '24   <a href="#">PDF</a>   <a href="#">Source</a>
01.2020	<b>ELF off the Shelf</b>	Unix-focused guest lecture in <a href="#">Macewan University's OS class</a>   <a href="#">Slides</a>
11.2017	<b>Cache Ruins Everything Around Me!</b>	Guest lecture in <a href="#">Macewan University's OS class</a>   <a href="#">Slides</a>
07.2017	<b>Let's Build A HyperCard RPG!</b>	Coding Livestream   <a href="#">Videos</a>
11.2016	<b>Hands-on HTTP/2, a Fresh Start to The Web</b>	QCon SF 2016   <a href="#">Event Page</a>
06.2016	<b>Beyond Breakpoints: A Tour Of Dynamic Analysis</b>	QCon NYC 2016   <a href="#">Video</a>   <a href="#">Materials</a>
12.2015	<b>Two Approaches towards OS Scalability</b>	Papers We Love SF 12/2015   <a href="#">Video</a>   <a href="#">Event Page</a>
09.2015	<b>Racing to Win: Correct Concurrency with Race Conditions</b>	Surge 2015   <a href="#">Video</a>   <a href="#">Materials</a>
04.2015	<b>Your Computer Is Already A Distributed System; Why Isn't Your OS?</b>	Papers We Love SF 04/2015   <a href="#">Video</a>   <a href="#">Event Page</a>
06.2014	<b>Your Heap And You: Garbage Collector Tuning for Twitter Services</b>	Internal tech talk
05.2013	<b>Cachekata: Memory Hierarchy Optimization via Dynamic Binary Translation</b>	Msc. Thesis   <a href="#">PDF</a>
04.2013	<b>Whose Cacheline is it Anyway: Operating System Support for Live Detection &amp; Repair of False Sharing</b>	Eurosys '13   <a href="#">PDF</a>
03.2012	<b>Debugging Through Time with the Tralfamadore Debugger</b>	RESolve '12   <a href="#">PDF</a>
08.2011	<b>Herbert West: Deanonymizer</b>	HotSec'11   <a href="#">PDF</a>
10.2010	<b>Iodine: Interactive Program Partitioning</b>	OSDI '10 Poster Session   <a href="#">PDF</a>