Ryan D. Torok

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Education

M.S.E. Computer Science, Princeton University, May 2023

B.S. Computer Science, Turing Scholars Honors, University of Texas at Austin, December 2020

Skills and Experience

My recent work has mostly involved systems programming in Rust, but I am also experienced with other systems languages (C, C++, Go) as well as high-level languages (C#, Java, Python, Dart, PHP, Perl, ...), SQL databases, Bash scripting, Web development, and Android app development.

Experience in designing and implementing computer systems from the ground up, reasoning about security, correctness, performance, trust, and incentives.

Academic Work

Only Pay for What you Leak: Leveraging Sandboxes for a Minimally Invasive Browser Fingerprinting Defense

> *with Amit Levy* | In Proceedings of the 44th IEEE Symposium on Security and Privacy, May 2023
>
> This paper introduces a novel browser fingerprinting defense called Sandcastle, which allows developers to partition code that uses identifiable APIs into sandboxes, enabling the browser to guarantee the data is confined to the client-side and safe to expose to the application without introducing random noise or charging the information to a limited entropy budget.

Improving Graph Workload Performance by Rearranging the CSR Memory Layout

> *with Calvin Lin and Akanksha Jain* | Undergraduate senior thesis, December 2020
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> My undergraduate thesis introduced two methods for optimizing hardware performance for static graph workloads. The first was a hardware prefetching technique for parallelizing edge loads for graphs using the CSR memory layout. The second was a variation on the CSR layout that enables graph workloads to fit more useful information into a single cache line to decrease the number of expected cache misses on a graph walk.

Industry Work

Software Engineer – zeroRISC (2023 - present)

> I work on software for the OpenTitan project, which is currently in a evaluation phase, but set to become production-ready by early 2025. My first project with the company is a cloud provisioning system.

Software Engineer – Boeing ISS and *Starliner* teams (summer 2019, spring-summer 2020, wnter-summer 2021)

> I tested new releases of the flight software for the International Space Station and CCTS *Starliner* spacecraft, with the latter set to fly astronauts for the first time in July 2023. I also developed a standalone tool that enabled large-scale verification of the ISS payloads that warmly update code constants in flight. During my third stint with the company in 2021, I worked on a series of major updates to the *Starliner* flight software test framework, which simplified the test startup procedure and reduced the waiting time between tests.

Teaching Assistantships

Princeton University

> Spring 2023 – COS 461, Computer Networks
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> Fall 2022 – COS 316, Principles of Computer System Design
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> Spring 2022 – COS 226, Data Structures and Algorithms
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> Fall 2021 – COS 318, Operating Systems

University of Texas

> Fall 2019 – CS 314H, Honors Data Structures

Fun Facts

Favorite programming languages: Rust and C#

I have played the cello since age 10 and performed in my hometown's All-Region Symphony four times in grade school, as well as at national competitions in Chicago, Pittsburgh, and New York City. I also volunteered to teach music to elementary students for five years as part of my school's strings program.

I also enjoy composing original orchestra music in my free time. In December 2018, I finished my first full orchestra composition, *Christmas in Boston.*