David Tran

davidtranhq@gmail.com | linkedin.com/in/davidtranhq | github.com/davidtranhq | davidtranhq.github.io

Education

Honors in Computer Science (HBsc.), Honors in Mathematics (HBsc.) — London, ON, Canada
Western University — *September 2020 - April 2025*

- **GPA**: 4.0/4.0 ; Cumulative Average: 96%; Highest standing in Computer Science at Western University (1/300)
- RBC Scholarship in Data Science ($25000, 1 of 5), National Undergraduate Student Research Award ($8400)
- 1st place from Western University in the International Collegiate Programming Contest (ICPC) NA Qualifier (2021, 2022)
- President of Western Competitive Programming, WesternAI Project Director
- **Coursework**: Operating Systems, Distributed Systems, Networks, Computer Architecture, Compilers, Systems Programming, Algorithms, Real/Complex Analysis, Abstract Algebra, Group Theory, Machine Learning, Game Theory, Parallel Programming, Statistics, Linear Algebra

Technical Skills

Languages: C++, C, Python, Java, TypeScript/JavaScript, Rust, SQL, Haskell
Skills: pandas, NumPy, PyTorch, SQLite, Firebase, Matplotlib, Qt, SDL, Anchor, React, Node.js, Express.js, AWS

Experience

Western University — London, ON, Canada
Mathematics/Computer Science Researcher — *September 2023 - April 2024*

- Studying quantum error-correcting with operator algebras, supervised by Dr. Masoud Khalkhali

Snowflake — San Mateo, CA, USA
Software Engineer Intern — *May 2023 - September 2023*

- Added profiling to the execution platform for operator-level performance statistics to diagnose causes of slow query execution and inefficient query compilation (C++)
- Developed a static-analysis code refactoring tool and a corresponding Jenkins build pipeline to remove stale feature flags and dead code throughout the Java codebase, reducing current and future technical debt (Java)
- Created an application to estimate potential impact of performance improvement ideas over different Snowflake workload dimensions using query compiler and execution platform performance data (Python, SQL)

Brain and Mind Institute — London, ON, Canada
Computational Neuroscience Researcher — *March 2022 – April 2023*

- Designing a novel ML model for generating functional parcellations of the cerebellum from low signal-to-noise fMRI data
- Researching hidden Markov model training algorithms, Bayesian unsupervised learning, approximate inference problems
- Implemented and optimized training algorithms on CUDA GPUs using PyTorch, reducing runtimes by 23%
- Awarded an $8400 Undergraduate Research Award from NSERC, a national award for research in Canada

Solana Labs — San Francisco, CA, USA
Software Engineer Fellow (MLH) — *June 2022 – August 2022*

- Deployed a smart contract for whitelisting transactions on the Solana blockchain using Anchor and Rust
- Reduced deployment cost by 50% by designing a data structure that is 2x as space-efficient using program-derived addresses

Open-Source Contributions

MathJS | *JavaScript, TypeScript*

- Contributor to MathJS, the most popular JavaScript math library with approximately 1.7 million downloads per month
- Implemented a fix for LaTeX parsing algorithms, with test cases to increase testing code coverage to 94% using TypeScript

ManagarmOS | *C++*

- Contributor to the Managarm Project, a microkernel-based operating system with 1000+ stars
- Fixed parts of the C++ Standard Library, a crucial component used across the entire 100,000+ LOC project

Projects

davOS | *C, C++, x86 Assembly*

- A monolithic POSIX-compliant operating system built from scratch supporting the Intel x86_64 architecture
- Implemented a physical and virtual memory manager using protected paging, free lists and an LRU page-replacement policy
- Uses a multi-threaded kernel with asynchronous event-handling to support process multitasking

QtBoy | *C++, GBZ80 ASM, Qt, SDL*

- Reverse-engineered Nintendo's hardware docs to build a Game Boy emulator, disassembler, debugger, and memory analyzer
- Wrote GBZ80 assembly programs to test the CPU, GPU, audio processing unit, timing, and display components
- Optimized frames-per-second performance by 100% by using multi-threading and detecting inefficiencies using perf/Valgrind

Other

Canada Swimming National Medalist, Olympic Trials Qualifier; ARCT Diploma in Piano Performance; Violin Provincial Finalist