

David Tran

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Canadian citizen, eligible for J-1 and TN visa sponsorship

Research Experience

2022-2023

COMPUTATIONAL NEUROSCIENCE RESEARCHER at Brain and Mind Institute; London, ON, Canada

- Designed a novel ML model based on deep restricted Boltzmann machines for generating functional parcellations of the cerebellum from low signal-to-noise fMRI data
- Researched hidden Markov model training algorithms, Bayesian unsupervised learning, approximate inference problems
- Implemented and optimized training algorithms on GPU clusters using PyTorch, reducing runtimes by 23%
- Awarded an \$8400 Undergraduate Research Award from NSERC, a national award for research in Canada

Engineering Experience

2023

SOFTWARE ENGINEER INTERN at Snowflake; San Mateo, CA, USA

- 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 predict the potential impact of performance-improving ideas over different Snowflake workload dimensions using query compiler and execution platform performance data. (Python, SQL)

SOFTWARE ENGINEER (MLH FELLOW) at Solana Labs; San Francisco, CA, USA

- Deployed a smart contract for whitelisting transactions on the Solana blockchain using Anchor. (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, symbolic and numerical JavaScript math library

- Implemented fixes for the LaTeX parsing algorithm for matrices and added test cases to increase test suite code coverage to 94%. (TypeScript)

MANAGARM, microkernel-based operating-system with fully asynchronous I/O

- Fixed the implementation of smart pointers in its C++ standard library implementation, rewritten to be more lightweight and usable in a freestanding environment. (C++)

OPENREWRITE, semantic source code search and transformation engine

- Modified the OpenRewrite parser to add support for parsing and transforming type annotations in Java source code. (Java)

Selected Projects

QTBOY, Game Boy and Game Boy Color emulator

- An emulator, disassembler, debugger, and memory analyzer for the Game Boy and Game Boy Color, made from scratch by reverse-engineering Nintendo's hardware documentation. (C++)
- Optimized frames-per-second performance by 100% using multi-threading and detecting inefficiencies using performance monitoring tools (e.g. perf, Valgrind).

DAVOS, monolithic kernel, POSIX-compliant operating system

- TODO.

TEX MATH PARSER, L^AT_EX math expression parser and evaluator

- A recursive-descent parser for evaluating and manipulating L^AT_EX math expressions in JavaScript and TypeScript. Used by over 50 open-source projects worldwide. (TypeScript)

MITRAS, linear algebra graphing calculator

- A graphing calculator for computing and visualizing linear algebra operations, including linear transformations, determinants, eigenvalues, and eigenvectors. (React, TypeScript)

Education

- 2025 BSc in Computer Science (Honors), Western University (96%)
COURSEWORK: Operating Systems, Parallel Programing, Distributed Systems, Networks, Computer Architecture, Compilers, Systems Programming, Data Structures and Algorithms
- 2025 BSc in Mathematics, Western University (92%)
COURSEWORK: Real Analysis, Complex Analysis, Abstract Algebra, Group Theory, Statistics, Linear Algebra, Discrete Maths

Leadership

Western Competitive Programming; President, Founder
WesternAI Project Director
Western Founders Network Project Director
Western Chess Club Executive
SheHacks Hackathon Mentor

Grants, Honours & Awards

- 2023 RBC Scholarship in Data Science, \$25000 (1 of 5 recipients from all of Computer Science, Data Science, Math, Applied Maths, Statistics, Physics)
- 2022-2023 1st Place in the International Collegiate Programming Contest (ICPC) North America Qualifier at Western University (2x)
- 2022 Edna Jeffrey Scholarship, \$500 (awarded to the highest standing in Computer Science)
- 2022 NSERC Undergraduate Student Research Award, \$8400
- 2022 RBC Design Thinking Program Member, \$3500 (1 of 21)
- 2021 Class of '49 Prizes (awarded to the highest standing in Computer Science Fundamentals II)
- 2021 Robert and Ruth Lumsden Scholarships in Science, \$1500 (high standing)
- 2020-2023 Nortel Networks Scholarships of Distinction in Computer Science, \$2000/year (high standing)
- 2020-2023 Dean's Honors List
- 2020 University of Western Ontario Scholarship of Distinction, \$3500 (high standing)

Other

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

Last updated: January 20, 2024