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)

2022   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 environnement. (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 inefficiences using performance monitoring tools (e.g. perf, Valgrind).

DAVOS, monolithic kernel, POSIX-compliant operating system

- An x86_64 operating system written from scratch with a multithreaded, monolithic kernel.

TEX MATH PARSER, LaTeX math expression parser and evaluator

- A recursive-descent parser for evaluating and manipulating LaTeX 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: February 7, 2024