

Adam Chen

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Experience

Oracle Labs (Incoming)

Jan 2025 – Apr 2025

Compiler Research Intern | Graal, Java, Just-In-Time Compilation

Zürich, Switzerland

- Extend GraalOS Virtualization Technology by supporting **Just-In-Time compilation** of Truffle Language Interpreters
- Enable languages such as **Python** and **JavaScript** to run on GraalOS with **native performance**.

Cynorix Inc.

May 2024 – Aug 2024

Full Stack Developer | React Native, Express.js, PostgreSQL, GKE & Vertex AI

Waterloo, Ontario

- Implemented a proprietary **content suggestion system** using AI vector embedding and hybrid semantic search, **enhancing content relevance** and personalization for end-users.
- Optimized query planning** and execution time by over **10x** by parallelizing subqueries and building HNSW indices over pgvector columns.
- Led the migration to a horizontally scalable Kubernetes cluster for jobs and backend services, **improving system reliability and scalability** to handle increased traffic and workload.
- Integrated business requirements into a user-friendly React Native app with corresponding Express.js backend services, **improving usability and functionality**.

Electrium Mobility

Feb 2024 – Present

Firmware Developer | C++, ESP32, Real Time Programming, Bluetooth LE

Waterloo, Ontario

- Designed a **low-power** monitoring system for an e-skateboard with Bluetooth LE, improving **metric tracking**.
- Implemented **real-time data streaming** (<100ms latency) to a mobile iOS app, enhancing **accuracy and reliability**.

Desa Analytics Corporation

Jul 2023 – Aug 2023

Machine Learning Intern | Python, Keras, Deep Learning

Toronto, Ontario

- Developed** deep learning models for regression, classification, and time-series analysis **using** Keras.
- Pre-processed **95,000+ samples** and optimized training hyperparameters to **97% accuracy** without overfitting.

Projects

Toyota Innovation Challenge (Winner) | Python, Computer Vision, PyTorch, Fine Tuning Deep Learning Models

- Won** the Toyota Innovation Challenge, **surpassing 30 competitors** with an advanced machine learning vision model.
- Developed an inspection model (based on fine-tuned YOLOv8) for sticker quality, enhancing product consistency.
- Optimized** for dark, low-contrast conditions, **outperforming** traditional vision systems.

root – An I/O Free, Loop Avoiding, Distance Vector Routing Framework | Rust, Network Routing, cargo Crate

- Developed an extendable routing framework loosely based on RFC 8966 (Babel) for **resilient mesh networks**.
- Designed support for IPv4, IPv6, and **custom address schemes**, including Cryptokey addresses (e.g., Wireguard).
- Baked-in support for **arbitrary** pluggable metrics to reduce latency, optimize bandwidth or other custom metrics.

VirtualEdit – Highly Optimized Game World Modification | Java, Minecraft, Server Plugin, Data Structures

- Developed a library to modify vast areas (>10⁹ blocks) **without client/server-side lag** using a 3D implicit segment tree and real-time packet manipulation.
- Formulated an efficient data structure **enabling** log-time operations on the order of 100ns over arbitrary ranges.

Awards and Achievements

USA Computing Olympiad: Platinum Division – Highest Division, ranked top 96 globally (US Open 2021)

Schulich Leader Scholarship (\$100,000): Offered by Schulich Foundation and McGill University (2023, Declined)

Undergraduate Research Award (\$6000): Natural Sciences and Engineering Research Council of Canada (2024)

Technical Skills

Languages: C#, Java, Python, C/C++, Rust, Bash, JavaScript, TypeScript, HTML/CSS, SQL, PostgreSQL

Technologies: .NET, ASP.NET (Core), WPF, Node.js, Svelte, React.js, Express.js, TensorFlow, Keras, Pandas, Tokio

Tools: Kubernetes, Helm, Docker, Git, NuGet, Maven, Gradle, CI/CD, Linux, AWS, Google Cloud, Azure

Education

University of Waterloo

Sept 2023 – Apr 2028

Bachelor of Software Engineering, Term Distinction (GPA: 3.97 / 4.00)

Waterloo, Ontario