

ZACHARY TIANYI TANG

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EDUCATION

University of Toronto

B.S., Computer Science; GPA: 3.93/4.00

Toronto, ON

Expected May 2027

WORK EXPERIENCE

UofT Dynamic Optimization & Operations Management Lab

Researcher

Toronto, ON

Sep 2025 - Present

- Key member driving **robotics and Vision-Language-Action (VLA) industry research** aimed at automating large-scale **car battery assembly** using UR5 robotic arm with Prof. Chi-Guhn Lee
- Engineered simulation environment in **IsaacSim/Lab**, establishing a **teleoperation pipeline** that generated the **critical training data necessary** to successfully transfer robotic policies to **physical hardware**
- Specializing in fine-tuning open-source VLA models ($\pi_{0.5}$) to develop a generalizable wire manipulator

Philer AI

Software Engineer

Remote

Apr 2025 - June 2025

- Spearheaded a **10+ member team** to **successfully deploy an end-to-end customer intake legal AI assistant to production**, managing the entire stack including **full-stack deployment on Google Cloud/AWS Lambda**
- Executed **experimental RAG research** on advanced retrieval methodologies, including **multi-step retrieval** and **prompt decomposition** to facilitate **complex user legal queries over a large corpus of legal documents**
- Developed a custom, explainable RAG evaluation framework on **Pinecone**, benchmarking performance across metrics like correctness and recall, achieving an **average metric boost of 18%** through hyperparameter tuning
- Built frontend with **Next.js/React**, backend with **Python/Flask** including **LangGraph multi-LLM-agent workflow**

FORMS Synttron Information HK

MLE Intern

Hong Kong SAR, China

May 2025 - June 2025

- Developed internal tool for **HSBC's largest branch (US\$3T+ in assets, 20,000+ employees)** to automate extraction of key data from unstructured police fraud reports for **financial fraud detection**
- Engineered a **distributed fine-tuning pipeline** for 70B LLM models using **LoRa and Transformers** to automate fraud data extraction, deploying and managing **large-scale SLURM jobs across an A100 GPU cluster**
- Led **weekly client meetings** to align evaluation metrics with their criteria, and boosted model accuracy on those metrics from **~70% up to 97%** through **few-shot prompt engineering and hard negative mining**
- Built **synthetic data pipeline** constructed from proprietary police report segments, growing dataset from **250 to 10,000+ realistic data samples** to improve domain-specific LLM performance

RESEARCH

Soundscape Audio Analysis on Hong Kong Pink Dolphin Population (Abstract)

Nov 2023

- Applied Fast Fourier Transforms to marine audio on **endangered pink dolphin conservation research** with WWF
- Presented at **IEEE 2024 Young Engineer's Conference** and the **American Geophysical Union Fall Meeting 2022**

PROJECTS & EXTRACURRICULARS

University of Toronto Machine Intelligence Student Team

Director of Research Collaborations

June 2025 - Present

- **PI** for 15+ researchers on two deep learning research projects in collaboration with the **University of Alberta**
- Leading **multi-agent RL** team investigating communication protocols for **Human-AI collaboration**
- Leading **real-time video super-resolution** team investigating **ESRGAN, Mamba, Swin** architectures

AlphaReversi | PyTorch, NumPy (GitHub)

- Implemented **AlphaGo** paper in **PyTorch** with **ResNet** networks and optimized **MCTS** using **NumPy**
- Trained agent via **self-play** reinforcement learning with policy/value updates

TECHNICAL SKILLS

Programming Languages: Python, JavaScript, Java, SQL, TypeScript, C#, C++, Go, Kotlin, Swift, Rust

AI/ML Frameworks: PyTorch, Unsloth, Hugging Face, LangGraph, OpenCV, NumPy, SciPy, IsaacLab, IsaacSim, USDA

Full-stack Development: React, Next.js, Flask, Django, HTML/CSS, Tailwind CSS, shadcn/ui

Databases & Tools: SQLite, Git, Docker, SLURM, Pandas, jsPDF, Linux, Bash, Ubuntu, vim

Nov 2025