Steric Tsui

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Education

University of Toronto **Expected: May 2027**
Bachelor of Science in Computer Science and Statistics *Toronto, ON*

Experience

Squirl ASL **Toronto, ON**
ML Engineer *Sep 2024 – April 2025*

- **Reduced inference computation by 33%** using a post-training dynamic frame sampling technique in Azure ML, prioritizing real-time **smooth user experience** without compromising model accuracy.
- Optimized to a Temporal Convolutional Network (TCN) by performing a grid search over key hyperparameters and implementing a Cosine Annealing scheduler, **resulting in an award-winning prototype.**
- Selected for the **Microsoft Startup Club** and funded by **Alterna Savings** to develop a B2B ASL translator.

University of Toronto – Github **Toronto, ON**
Research Assistance | PyTorch, Google Cloud Platform, LeanDojo, Lean4, Docker, Jira *Jan 2024 – April 2025*

- Conducted original research under Dr. Mohammad to build an RL-based theorem prover extending AlphaProof using **R'max Tree Search**, **achieving 87% on college-level proofs surpassing expected baselines**.
- **Extract over 100k+ proof data** by engineered a scalable **ETL** data pipeline in GCP, leveraging LeanDojo to transform data into usable structured datasets from different repositories for downstream training.
- Containerized workflows with **Docker** and coordinated iterations via **Jira**, ensuring reproducibility across research.

Projects (more project on Website)

Video Upscaling (UTMIST research) | *PyTorch, SciPy, Scikit-learn, Matplotlib, GCP, CUDA* **Github**

- **Improved real-time video quality by 50%** in the Real-ESRGAN research by refining frame reconstruction algorithms and reducing visual artifacts; contributed enhancements applied to real-time streaming and video conferencing.
- **Achieved an 18% PSNR gain** by optimizing GAN-based super-resolution models in PyTorch, through advanced loss function tuning (perceptual, SSIM) and architectural modifications.
- Exploring GPU acceleration and low-latency inference techniques to enable practical deployment in real-world.

Airplane Boarding Optimization via RL | *PyTorch, Gymnasium, SB3, TensorBoard, Pygame* **Github**

- **Achieved a 75% improvement in passenger flow efficiency** by implementing a **Maskable PPO** agent with action masking, trained via **Stable-Baselines3** in a custom **Gymnasium environment** of airplane boarding simulation.
- Accelerated convergence **by 90%** and improved generalization **by 15%** by vectorizing env to enable parallel training.
- Monitored training performance using **TensorBoard**, analyzing metrics such as **reward trends**, **KL divergence**, **explained variance**, and **clip fraction** to ensure stable policy updates.

Technical Skills

Languages: Python, C++, Java, HTML/CSS, JavaScript, PostgreSQL, MongoDB
Frameworks: Tensorflow, Pandas, Numpy, Scikit-learn, LangChain, FastAPI, Streamlit
ML: Linear & Logistic Regression, SVM, KNN, Decision Trees, Random Forests, GLM, GAM
Deep Learning: MLP, CNNs, LSTM, TCNs, Attention Mechanisms, Backpropagation, ReLU, Sigmoid
RL: Monte Carlo, RMax, DQN, Q-Learning, PPO, GRPO
Cloud: GCP (GCS, Cloud Scheduler Functions, BigQuery), AWS (S3, Sagemaker), Jupyter
Rest: ML lifecycle, SAS & SDLC & MATLAB programming, MLOps, CI/CD pipelines, DevOps
Certification: AWS Machine Learning Engineer-Associate, Oracle Cloud Foundations Associate, Google Cloud Essentials

Leadership / Extracurricular

1x Hackathon Winner

- **Orbit (Winner @ Hack the Valley)** – **Devpost** | *Next.js, Three.js, LangGraph, FastAPI, Redis, Docker*

UofT AI **Toronto, ON**
Conference Team *Jun 2024 - Present*

- Acted as a key communication link between multiple internal teams to coordinate planning & logistics for the conference

The AI Collective **Toronto, ON**
Event Coordinator *May 2025 - Present*