

# STERIC TSUI

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## Experience

### Squirrel ASL

Toronto, ON

ML Engineer

Sep 2024 – April 2025

- Selected for the **Microsoft Startup Club** and funded by **Alterna Savings** to develop a B2B ASL translator.
- Contributed 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**.
- 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.**

### TinyProof – 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.**
- Engineered a scalable **ETL** data pipeline in GCP, leveraging LeanDojo to **extract 100k+ proof data** from different repositories and transform it into usable structured datasets for downstream training.
- Containerized workflows with Docker and coordinated iterations via Jira/CI, ensuring reproducibility across research.

## Education

### University of Toronto

Expected: May 2027

Bachelor of Science in Computer Science and Statistics

Toronto, ON

## Projects (more project on Website)

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

Aug 2025 – Present

- Contributing to the Real-ESRGAN research project, enhancing **real-time video upscaling quality for streaming and conferencing** by refining frame reconstruction techniques and reducing visual artifacts.
- Implementing and optimized GAN-based super-resolution models in PyTorch, **achieving an 18% PSNR gain** 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 – Github | PyTorch, Gymnasium, SB3, TensorBoard, Pygame

Aug 2025

- Trained a **Maskable PPO agent** using **Stable-Baselines3** with action masking, improving passenger flow efficiency by **75%** in a custom **Gymnasium environment** simulating airplane boarding dynamics.
- Vectorized the env to enable parallel training, accelerated **convergence** by 90% and improved **generalization** by 15%
- 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

### UTMIST – University of Toronto Machine Intelligence Student Team

Sep 2025

Research Associate

- North America's largest student-led AI/ML organization, focusing on research, education, and industry collaboration.
- Supported ongoing AI/ML research and assisting with data preprocessing, literature reviews, and experimental setup.

### The AI Collective

May 2025

Event Coordinator

- Facilitated a monthly toronto based AI-focused Coffee Chats, increasing member engagement and fostering networking opportunities within a 70,000+ member community

### UofT AI

Jun 2024

Conference Team

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