

# Jessica Tang

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## EDUCATION

### University of Toronto

Sep 2022 – Apr 2026

*BASc in Engineering Science (Machine Intelligence)*

- **Relevant Courses:** Data Structures & Algorithms, Machine Learning, Foundations of Computing, Vector Calculus, Probability & Statistics, Matrix Algebra & Optimization, Ordinary Differential Equations, Engineering Design
- **Honours:** Dean's Merit Award, Dean's Honours List 2023 & 2024, RBC Leadership in Technology Award

## SKILLS

**Programming Languages:** Python, C/C++, MATLAB, HTML, CSS, JavaScript, Assembly, Verilog

**Frameworks & Tools:** PyTorch, Open3D, Cython, NumPy, Pandas, Git, JOSM

## EXPERIENCE

### Machine Learning Researcher (NLP)

Apr 2024 – Present

*KITE Research Institute | Python, PyTorch, Ollama*

- Designed a novel pipeline leveraging large language models (LLMs) to generate exercise quality assessment and textual feedback for virtual physical rehabilitation, achieving 78% accuracy with an adapted Auto-CoT algorithm.
- Trained graph network (ST-GCN) for classification and Grad-CAM for explainability and prompt experiments.
- Tokenized skeletal data from an RGB camera with a variational autoencoder (VQ-VAE) for input to LLM
- **Highlights:** Transform HF Research Award

### Perception Researcher (Computer Vision)

Apr 2024 – Present

*Toronto Robotics and AI Lab (TRAIL) | Python, Open3D, JOSM*

- Benchmarked 3D lane detection for autonomous vehicles under adverse weather conditions.
- Implemented road-marking validation algorithms and automatic lane line labeller with 95% mean average precision.
- Optimized conversion pipeline of a 100,000+ node DMP map to a fully connected HD map.

### Machine Learning Research Assistant

May 2023 – Present

*University of Toronto Cognitive Neuroscience Lab | Python, PyTorch, C++, MATLAB*

- Designed a task-agnostic CNN architecture modeling robotic hand grasp predictions and object classification as biological control systems, reaching a test accuracy of 81.5% and 85%, respectively.
- Implemented neural network explainability analysis (Neuron Shapley, activation maximization, RSMS).
- Programmed a fully automated Python EEG experiment with motion capture sensors and synchronization.
- **Highlights:** Society of Neuroscience Conference 2023, 2024, Cognitive Neuroscience Society Conference 2024.

### President and Founder

Jul 2020 – Present

*Illuminaite Academy | HTML, CSS, JavaScript, Hugo*

- Increased accessibility to ethical CS & AI education by hosting interdisciplinary workshops, guest speakers from IBM, MIT, and UofT, teaching Introduction to CS & AI programs, and the annual Canadian AI Ethics Competition.
- Led a team of 20, organized 14 events, garnered 400+ participants from 42 cities and 11 countries, 2-time grant award recipient.

## PROJECTS

**MedMax** | Python, Langchain, Azure AI Speech, and Streamlit

Mar 2024

- Deployed AI-powered medical translation platform with speech detection and RAG for dynamic information retrieval.

**Speech to Sign Language Translator** | Python, Cohere API, TKinter

Mar 2023

- Trained 6 language models to recognize, detoxify and translate speech to sign language with sentiment analysis in real-time.
- **Highlights:** 1st Place Overall at NSBE Hackathon 2023 and Best Cohere Project.

**Deep Reinforcement Learning Indoor Farm Controller** | Python, TensorFlow

Jun 2021

- Implemented and trained a Deep Q-Learning Neural Network to autonomously control irrigation and indoor farm conditions to optimize plant growth, employing experience replay memory.
- **Highlights:** Best Presenter Award at the International Student Conference on Artificial Intelligence 2021.