

# Xin Lei Lin

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## EDUCATION

### University of Toronto – St-George (Trinity College)

Toronto, Ontario, CA

*Bachelor of Science – Computer Science Specialist (COOP), and Molecular Genetics Major*

*Aug. 2023 – May 2027*

- Entrance awards: **C. David Naylor Scholar for Leadership** (\$20k) & **Arts and Science Scholar** (\$7.5k)
- Prizes: **Winner** at **Hack The North** (Top 12 of 264 Projects), **UofTHacks** (Cohere 1<sup>st</sup> Prize - \$1.5k), **UTRA Hacks** (Starknet & Flow - \$ 1k), **MakeUofT** (Qualcomm 2<sup>nd</sup> & Flow - \$1.2k), and Science Fairs (\$16k+ in 3 yrs)
- High School Leadership: **Student Council President**, **Publication Director of *Le Manifeste* and *The Last Word*** (total 160+ pages), **BrébeufHx Vice-President & MariHacks Organizer** (800+ participants).

## EXPERIENCE

### Machine Learning Researcher with Prof. Pascal N. Tyrrell

September 2024 – Present

Medical Imaging Department (University of Toronto)

*Toronto, Ontario, CA*

- Using **Latent Conditional Diffusion (LCD)** to generate labeled data points (image and segmentation mask) to improve generated tissue fidelity & diversity, and segmentation performance for datasets with limited labels.

### Computer Vision Researcher with Prof. Babak Taati

February 2024 – Present

NSERC and KITE Computer Vision Lab (University of Toronto)

*Toronto, Ontario, CA*

- From **image-by-image** to **video** 2D human pose detection through **VideoMamba** and **InfiniAttention**.
- Experimented with VideoMamba and Vision Transformers **encoders** for **SMPL mesh recovery** and **keypoints coordinates regression** from heatmaps. Added an **InfiniAttention backbone** for videos (32 frames).
- **Pretrained** the image backbone on MS-COCO pose (136K frames) & **trained** the Infini-Attention video backbone on JHMDB (10K frames) and FreeMan (11M frames) resulting in SOTA accuracy for noisy videos.

### Machine Learning Engineer

July 2024 – Present

Kadist

*(Remote) – San Francisco, California, US*

- Deployed [rsonart.com](https://rsonart.com), an art gallery chat web application with vision and audio capacities for **Kadist**.
- Implemented Retrieval-Augmented Generation (RAG) with history-aware & ensemble retrieval, rerank and FAISS.
- Generated embeddings of **308768 artists** and **2851 artworks** webscraped from ArtFacts, Kadist and E-flux.
- Hosted a Flask (Gunicorn/Nginx) backend, a NEXT.JS frontend and Google Cloud + Firebase for user data.

### Dry Lab Machine Learning Team Member

April 2024 – Present

PlasmidAI - Internationally Genetically Engineering Machine (UToronto Team)

*Toronto, Ontario, CA*

- **Awards: Top 10 of 500+ teams globally & Winner of Best Model.** [IGEM Wiki](#)
- Worked on [plasmidai](#) (largest open-source ML toolkit for plasmid foundation models) with [Prof. Michael Garton](#)
- Fine-tuned **Evo** (a Striped-Hyena genome model) to generate plasmid sequences with antibacterial resistance.

### Machine Learning Researcher with Prof. Houari Sahraoui

October 2022 – September 2023

DIRO (University of Montreal)

*Dallas, Texas and Montreal, Quebec*

- Represented **Team Canada (top 12 projects nationally)** at **ISEF 2023 (10 awards combined - \$15k+)**.
- Developed and benchmarked **computer vision architectures** to translate American Sign Language to English.
- Model architectures trained include Fine-tuned Resnet + CNNs / LSTM + MLP, to translate **25 gestures**.

## PROJECTS

### Re.Live – UofTHacks 11 (Cohere 1<sup>st</sup> Prize (\$1500))

January 2024

- Integrated a **diffusion model – DDPM** model to produce videos of people from static images dancing!
- Integrated **Cohere RAG** to search a database of 100 songs with the user's mood. Frontend in **React**. [Devpost](#)

### DriveSense – HackTheNorth (Winning Finalist Project)

September 2023

- Mobile app to assist drivers with **vision models** for car plates, traffic lights and road signs (PyTorch). [Devpost](#)

## TECHNICAL SKILLS

**Languages Spoken:** French (Native), English (Native), Mandarin (Fluent), Spanish (Proficient)

**Programming Languages:** C/C++, Python, R, Shell (Bash), Java, SQL, Dart (Flutter), JavaScript, HTML/CSS

**ML/DS Tools:** Torch, CUDA, DDP, Lightning, Tensorflow, OpenCV, Pandas, Numpy, Google Cloud, SciNet (slurm)

**Other:** Linux/Unix, Docker, Kubernetes, Tmux/Vim/VSCode, Git/GitHub, Flask/Django, React, MongoDB/Postgres