Hannah Ye

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EDUCATION

University of Toronto — Sep. 2023 – Present
BASc in Computer Engineering, cGPA: 3.77/4.0 — *Toronto, ON*

- Minor in Artificial Intelligence Engineering
- Paul Cadario Experiential Learning Student Awards in Engineering, NSERC Undergraduate Student Research Award, Dean's Merit Award, Edward S Rogers Sr. Admission Scholarship, Faculty Of Applied Science And Engineering Admission Scholarship

EXPERIENCE

Machine Learning Researcher — May 2025 – Present
University of Toronto, Prof. Jonathan Rose's Research Group — *Toronto, ON*

- Designed multi-agent LLM pipelines for concept feature extraction, labeling, and evaluation, including automated file organization, CSV generation for each round of labeling, and robust API error handling with retry loops.
- Developed single prompted and multi-agent conversational therapy systems using Motivational Interviewing techniques to motivate tobacco smokers to quit smoking, showing automation of talk therapy with a modern LLM has promise.
- Extracted Llama and GPT-OSS word embeddings, performed principal component analysis to enhance computational efficiency while maintaing meaningful semantic information for downstream analysis.

Machine Learning Developer — May 2025 – Aug. 2025
Philer AI, UTMIST — *Toronto, ON*

- Integrated LLMs and Pinecone-based RAG pipelines to automate real estate form processing and customer queries.
- Utilized documentAI to detect bounding boxes, then used docTR to perform OCR, achieving 77% test accuracy.

Web Developer — Feb. 2025 – Apr. 2025
Lovelytics, UTMIST — *Toronto, ON*

- Built an LLM-powered chatbot using LangGraph-based RAG pipeline for dynamic task automation and user interaction.
- Implemented APIs to integrate the ONET database with a Flask backend and React frontend, enabling efficient retrieval and display of profession and task data for user interaction.

Computer Vision Developer — Sep. 2024 – Apr. 2025
Autonomous Rover Team, UTRA — *Toronto, ON*

- Optimized YOLOv8 with quantization and pruning, reducing inference latency by 94% for real-time perception.
- Labeled and trained models for diverse ramp data; implemented multi-modal object detection strategies.

PROJECTS

Neighbourhood Explorer (GIS Tool) — Jan. 2025 – Apr. 2025

- Implemented pathfinding and optimization algorithms (Dijkstra's, A*, 3-opt, genetic algorithms, reinforcement learning) for the TSP problem and improving the path cost by 8% from heuristics.
- Optimized C++ functions and STL usage using data structures for faster computation, improving runtime by 10%.

Beat Buddy — Feb. 2025

- Designed and implemented an Arduino-based embedded system using force sensors to measure step frequency and dynamically sync music BPM via the Spotify API, including real-time sensor data acquisition and signal processing.
- Developed a full-stack Flask + React application to interface with the embedded system, enabling real-time user interaction, automated music control, and seamless communication between hardware and software components.

Remember Granny (Hackathon) — Oct. 2024

- Created a security education website using HTML/CSS and Groq APIs within 24 hours.
- Trained LSTM model for password strength classification with 98.7% accuracy.

Diabetic Retinopathy Detection — Jun. 2024 – Aug. 2024

- Built a CNN with transfer learning (VGG-16) and image preprocessing in PyTorch for multi-class DR classification.
- Applied data augmentation, hyperparameter tuning, and visualization to improve model interpretability and performance.

SKILLS SUMMARY

Languages: Python, C/C++, Java, JavaScript, TypeScript, HTML/CSS, LaTeX, RISC-V Assembly, MATLAB, Verilog
Machine Learning & AI: CNN, RNN, Transformers, Reinforcement Learning, MLPs
Libraries/Frameworks: PyTorch, TensorFlow, LangChain, LangGraph, OpenCV, Scikit-learn, Pandas, NumPy, React, Flask, ROS, Matplotlib
Tools: Git, GCP, AWS, Pinecone, VS Code, Google Colab, Eclipse