Daniel Choi

647-336-3248 | danielchoi360@gmail.com | Linkedin | Website

Education

University of Toronto — Toronto, ON
Bachelor of Applied Science & Engineering, Minor in Robotics, Certificate in AI — *May 2024*

University of Toronto — Toronto, ON
Master of Applied Science & Engineering, AI/Robotics — *June 2026*

Experience

Undergraduate Thesis Researcher — Sept 2023 – May 2024
University of Toronto, Autonomous Systems and Biomechatronics Lab — *Toronto, ON*

- Created a large-scale social robot navigation environment in **Isaac Gym**, improving training efficiency by 75%
- Leveraged **RLHF** with Nvidia's Eureka framework for adaptive reward tuning, boosting performance by 50%
- Applied **CUDA** parallel programming to reduce training time by 60%, optimizing for **large model frameworks**
- Utilized PyTorch distributed training for low-latency inference, reducing execution times by 25%

ML/Software Engineer — Jan 2023 – Dec 2023
ONE800 — *Toronto, ON*

- Spearheaded **user engagement** optimization project, increasing user interaction by 20% with predictive modeling
- Enhanced an **LLM chat-bot** with **long-term memory** and increased user base by 12%
- Integrated **OCR** feature with **GCP** & **OpenAI API**, increasing daily active users by 10% and feature use by 15%
- Deployed **autonomous agents** for customer support, reducing response time by 25%

Mechatronics Engineer — July 2021 – Aug 2022
Thornhill Medical — *Toronto, ON*

- Led the ventilator algorithms team using **predictive learning**, contributing to UHN research
- Enhanced ventilator airflow by 20% with an **RL-based PID Controller** optimization in **C++/Linux**
- Performed **quality validation** with physicians, researchers, and military professionals for **Ukraine deployment**
- Utilized **Python** to engineer and visualize ventilator flow data, aiding hypoxia emergency responses of 10 patients

Artificial Intelligence Researcher — May 2019 – Sept 2019
University of Toronto Robotics and AI Lab — *Toronto, ON*

- Engineered **IR detection** algorithm using **ROS**, **C++**, **Python**, amassing 50GB data points
- Transformed **U-Net** with **attention mechanisms** for segmentation, achieving 90% accuracy
- Utilized **MLPerf** benchmarks to evaluate and improve model performance, achieving a 20% increase in efficiency
- Implemented Google's **Inception-V3 CNN** and achieved 94.4% accuracy in classifying farm animal species
- Optimized models for **low precision inference** using **Horovod**, improving inference speed by 30%

Publications

FINDER | *CoRL Workshop 2024, ICRA, arXiv* — April 2024 – October 2024

- Developed Finder, for Multi-Object Search, achieving 95.7% higher success and 3.3x **MSPL** on **HM3D** & **MP3D**
- Designed **multi-channel score maps**, boosting success rates by 9% over ablated models in simulations
- Validated scalability and **sim-to-real** performance, achieving 85% success in real-world object-dense environments
- Demonstrated **scalability**, maintaining efficiency with up to 8 objects and converging exploration time at 300 steps

OLiViA-NAV | *Spotlight Paper at CoRL 2024, ICRA, arXiv* — June 2023 – Sept 2024

- Developed OLiVia-Nav, reducing **MSE** by 50% and personal space violations by 60% over state-of-the-art methods
- Pioneered **SC-CLIP**, enhancing robot response speed by 5x for real-time adaptation to **social interactions**
- Conducted **HRI** experiments, improving user comfort and achieving the lowest **Hausdorff loss** in real-world tests
- Integrated multimodal predictors, combining visual and LiDAR data for **socially aware navigation**

Technical Skills

Languages: Python, C/C++, SQL, JavaScript, Java, MATLAB
Frameworks: TensorFlow, Pytorch, Keras, JAX, XGBoost, DVC, MLflow, CUDA, Hugging Face
Tools: ROS/ROS2, Isaac Gym, Habitat, Pybullet, Gazebo, Mujoco, Langchain, Pinecone, Shell, Git, Docker, AWS
Libraries: Scikit-learn, SciPy, MXNet, Open3D, OpenCV, ONNX, CGAL