

# SHENGXIANG SUN

☎ +1 4169026176 ◇ ✉ owen.sun@mail.utoronto.ca ◇ 🌐 Personal Website ◇ 🎓 Google Scholar ◇ 🐙 GitHub

## EDUCATION

University of Toronto

Sep 2022 – (expected) Apr 2026

Honours Bachelors of Science in Computer Science

- GPA: 3.82/4.00

## RESEARCH EXPERIENCE

- Visiting Research Assistant, University of Utah  
Topics: Multi-skill In-context Imitation Learning from Human Videos  
Aug 2025 – Present  
Advisor: Prof. Weiyu Liu
- Visiting Research Assistant, National University of Singapore  
Topic: Learning Robotic Assembly from Abstract Manuals  
Oct 2024 – Sept 2025  
Advisor: Prof. Lin Shao
- Undergraduate Research Assistant, University of Toronto  
Topic: VLA Failure Detection, Point-Cloud Forecasting  
May 2024 – Aug 2025  
Advisor: Prof. Florian Shkurti

## PUBLICATIONS

\* indicates equal contribution

- 1 [ICRA 2026 (Under Review)] C. Tie\*, S. Sun\*, Y. Lin, Y. Wang, Z. Li, Z. Zhong, J. Zhu, Y. Pang, H. Chen, J. Chen, R. Wu, L. Shao, “Manual2Skill++: Connector-Aware General Robotic Assembly from Instruction Manuals via Vision–Language Models”
- 2 [NeurIPS 2025] Q. Gu, Y. Ju, S. Sun, I. Gilitschenski, H. Nishimura, M. Itkina, F. Shkurti, “SAFE: Multitask Failure Estimation for Vision-Language-Action Models” [Paper] [Website]
- 3 [RSS 2025] C. Tie\*, S. Sun\*, J. Zhu, Y. Liu, J. Guo, Y. Hu, H. Chen, J. Chen, R. Wu, L. Shao, “Manual2Skill: Learning to Read Manuals and Acquire Robotic Skills for Furniture Assembly Using Vision-Language Models” [Paper] [Website]

## RESEARCH PROJECTS

Multi-skill In-context Imitation Learning (ICIL) from Human Videos (Ongoing)

Advisor: Prof. Weiyu Liu, Assistant Professor, Utah, CS

Aug 2025 – Present

- Training and evaluating a video-conditioned Diffusion Policy for assembly tasks within IsaacGym
- Created a dataset of long-horizon furniture assembly using FurnitureBench, IsaacGym, and LeRobot

Manual2Skill++: Connector-Aware General Robotic Assembly from Instruction Manuals via Vision–Language Models

Advisor: Prof. Lin Shao, Assistant Professor, NUS, CS

Apr 2025 – Sept 2025

- Developed a novel dataset representing connector placements (e.g., screws, nails) for assembly objects, converting abstract manual illustrations into a unified hierarchical graph representation for connector-aware assembly
- Proposed a benchmark for automatic extraction of connector placements and graph generation from manuals

Improving Point-Cloud Forecasting Accuracy, CS Project Course

Advisor: Prof. Florian Shkurti, Assistant Professor, UofT, CS

May 2025 – Aug 2025

- Developed an end-to-end model that integrates BEV features from multi-view RGB images with temporal point cloud data to improve future forecasting on the NuScenes dataset

## SAFE: Multitask Failure Estimation for Vision-Language-Action Models

Advisor: Prof. Florian Shkurti, Assistant Professor, UofT, CS

May 2024 – May 2025

- Performed ablation studies on input representations (raw images vs. VLA’s final layer embeddings) for training and evaluating the failure estimation module
- Developed a PyTorch & SimplenEnv pipeline to fine-tune VLAs on mixed datasets from OXE with SLURM

## Manual2Skill: Learning to Read Manuals and Acquire Robotic Skills for Furniture Assembly Using Vision-Language Model

Advisor: Prof. Lin Shao, Assistant Professor, NUS, CS

Nov 2024 – Feb 2025

- Employed VLMs to generate high-level furniture assembly plans from IKEA manuals, achieving generalization across diverse furniture types and exceeding previous baselines by over 300%.
- Generated 10,000+ furniture parts via a novel, automated Blender pipeline to simulate realistic assembly scenes

## ACADEMIC SERVICE

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Reviewer for ICRA 2026, CVPR 2025 Robo-3DVLM

## RESEARCH INTERESTS

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My research spans **Robotics** and **3D Vision** to enable **generalizable robot manipulation**. I aim to develop systems that execute complex, long-horizon tasks from simple instructions (e.g., “prepare a dish from this cookbook”) by learning from existing human knowledge with foundation models, rather than collecting data from scratch.

## SCHOLARSHIPS & AWARDS

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- **2022-2025 General In-Course Scholarship** (For maintaining a GPA of at least 3.7/4.0) (CAD 12,000)
- **2023-2025 Dean List Scholar**
- **2024 Summer NSERC Math & Computer Science Research Award** (CAD 8,000)
- **2024 First Place, GenAI Genesis (Canada’s Largest AI Hackathon) – Best Safety AI**

## WORK EXPERIENCE

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### Loblaw Digital

Machine Learning Engineer Co-op - Generative AI Team

**Toronto (CA)**

Jan 2024 – Apr 2024

- Enhanced an automated email reply system using Google’s Gemini Pro, Python, Docker, CI/CD, Few-Shot and Chain-of-Thought prompt engineering, which resulted in over 3400 correctly automated email replies per week.
- Developed an end-to-end machine learning pipeline for enhanced shopping experience, with OpenAI’s GPT-4 Vision, Python, Pandas, SQL, Apache Airflow DAGs, and Google Cloud Platform, which automatically generated product descriptions for 154,286 products sold at Loblaws, Shoppers Drug Mart, and Joe Fresh

### New H3C Technologies

Machine Learning Research Intern

**Beijing (CN)**

Jul 2023 – Aug 2023

- Designed training & testing pipelines of Llama2, Dreambooth, InstructPix2Pix on MobaXterm and WebUI, by using PyTorch and HuggingFace, which doubled the team’s testing data outputs
- Enabled automated downloads of Python dependencies with bash scripting, reducing installation steps by 40%

## PROGRAMMING SKILLS & LANGUAGE SKILLS

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**Proficient** Python, LaTeX, HTML

**Familiar** PyTorch, Linux, C, Java, Git

**Chinese (Native), English (Fluent), French (Intermediate)**