Jun Jin, PhD

Department of Electrical and Computer Engineering, University of Alberta Email:jjin5@ualberta.ca
Google Scholar: /citations?user=a6grwUcAAAAJ

Education

University of Alberta Edmonton, Canada
Ph.D. Computing Science 2017 – 2021
Thesis: *Learning Geometry from Vision for Robotic Manipulation*
Ph.D. student in Construction Engineering and Management 2016 – 2017
Wuhan University Wuhan, China
M.Eng. Geomatics Engineering 2012
B.A. Geodesy and Geomatics Engineering 2010
B.A. Computer Science 2010

Academic Appointment

Assistant Professor, University of Alberta Aug 2023 – present

Honors and Awards

Gold Reviewer Award, International Conference on Machine Learning (ICML) 2026
Fellow, Alberta Machine Intelligence Institute (Amii) Sep 2023 – present
ICRA 2022 Outstanding Student Paper Finalist (top 3 runner-up) 2022
IEEE Robotics and Automation Society. Only 1 paper selected each year.
Alberta Graduate Excellence Scholarship, Government of Alberta 2020
ICRA Travel Award, IEEE Robotics and Automation Society 2019
KUKA Innovation Award Finalist (Top 5 Global) 2018
Science&Technology Award, 2nd Prize, Government of Hunan Province, China 2015
Science&Technology Award, 1st Prize, Nonferrous Metals Society of China 2014
Science&Technology Award, 2nd Prize, State Bureau of Surveying and Mapping, China 2012

Research Interests

Robotics · Reinforcement Learning · Continual RL · Embodied AI
Open-Ended Agent Learning
Applications: Healthcare and Household Robotics

I investigate how intelligent machines can learn and adapt continuously through real-world interactions. I focus on the intersection of reinforcement learning (RL) and embodied artificial intelligence (EAI), studying how robots acquire, refine, and reuse motor skills through direct interaction with their physical environment.

Peer-reviewed Publications

Refereed Journals:

[1] X. Shi, Y. Hu, and J. **Jin**, "FRMD: Fast robot motion diffusion via trajectory-level consistency distillation," *Frontiers in Robotics and AI, Sec. Robot Design*, vol. 13, p. 1751688, March 2026.

[2] X. Ge, M. Lu, and J. **Jin**, "Applying deep reinforcement learning for construction labour dispatching in a union hall setting," *Automation in Construction*, vol. 184, p. 106838, April 2026.

[3] Y. Hu, Y. Ou, A. Sieben, Z. Samadikhoshkho, B. Zheng, J. **Jin**, and M. Tavakoli, "Learning from imperfect demonstrations in a surgical training task," *Biomedical Signal Processing and Control*, vol. 112, p. 108487, February 2026.

[4] Y. Hu, M. Tavakoli, and J. **Jin**, "Pretraining using comparable human activities of daily living dataset in robotic surgical task learning," *IEEE Transactions on Medical Robotics and Bionics*, 2025. Accepted May 2025, published June 2025.

[5] Y. Hu, Z. Samadikhoshkho, J. **Jin**, and M. Tavakoli, "Label-free adaptive gaussian sample consensus framework for learning from perfect and imperfect demonstrations," *IEEE Transactions on Medical Robotics and Bionics*, 2024.

Conference Proceedings:

* IEEE ICRA is the most cited venue in robotics (Google Scholar). IEEE IROS is 4th.

[6] K. Sun, H. Zhang, J. **Jin**, C. Gao, X. Chen, W. Liu, and L. Kong, "Principled fast and meta knowledge learners for continual reinforcement learning," in *International Conference on Learning Representations (ICLR)*, **2026**.

[7] R. H. Yang, X. Zhao, L. M. Brunswic, M. Alban, M. Clemente, T. Cao, J. **Jin**, and A. Rasouli, "CAPE: Context-aware diffusion policy via proximal mode expansion for collision avoidance," in *IEEE International Conference on Robotics and Automation (ICRA)*, **2026**.

[8] D. Shi and J. **Jin**, "FRMD: Fast robot motion diffusion with consistency-distilled movement primitives for smooth action generation," in *Robotics & Intelligent Systems Expo (RISEx),* ***Selected for Oral Presentation***, **2025**.

[9] Y. Hu, M. Tavakoli, and J. **Jin**, "Transferring human daily activity skills to surgical robots via deep successor features," in *Robotics & Intelligent Systems Expo (RISEx)*, **2025**.

[10] X. Ye, R. H. Yang, J. **Jin**, Y. Li, and A. Rasouli, "Ra-dp: Rapid adaptive diffusion policy for training-free high-frequency robotics replanning," in *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2025. Accepted June 2025, to appear July 2025.

[11] Y. Mu, Q. Zhang, M. Hu, W. Wang, M. Ding, J. **Jin**, B. Wang, J. Dai, Y. Qiao, and P. Luo, "Embodiedgpt: Vision-language pre-training via embodied chain of thought," in *Advances in Neural Information Processing Systems (NeurIPS),* ****Spotlight Paper****, **2023**.

[12] H. Zhang, C. Xiao, H. Wang, J. **Jin**, B. Xu, and M. Muller, "Replay memory as an empirical mdp: Combining conservative estimation with experience replay," in *International Conference on Learning Representations (ICLR)*, **2023**. Presented on May 1st, 2023, Kigali, Rwanda.

[13] A. Karimi, J. **Jin**, J. Luo, A. R. Mahmood, M. Jagersand, and S. Tosatto, "Variable decision-frequency option critic," in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, **2023**.

[14] B. Rafiee, S. Ghiassian, J. **Jin**, R. Sutton, J. Luo, and A. White, "Auxiliary task discovery through generate and test," in *Second Conference on Lifelong Learning Agents (CoLLAs)*, **2023**.

[15] J. **Jin**, D. Graves, C. Haigh, J. Luo, and M. Jagersand, "Offline learning of counterfactual predictions for real-world robotic reinforcement learning," in *2022 IEEE International Conference on Robotics and Automation (ICRA)(* **Oustanding Student Paper Award Finalist**)*, pp. 3616–3623, IEEE, **2022**.

[16] J. **Jin** and M. Jagersand, "Generalizable task representation learning from human demonstration videos: a geometric approach," in *2022 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 2504–2510, IEEE, **2022**.

[17] L. Petrich, J. **Jin**, M. Dehghan, and M. Jagersand, "A quantitative analysis of activities of daily living: Insights into improving functional independence with assistive robotics," in *2022 International Conference on Robotics and Automation (ICRA)*, pp. 6999–7006, IEEE, **2022**.

[18] J. **Jin**, H. Zhang, and J. Luo, "Build generally reusable agent-environment interaction models," in *Advances in neural information processing systems (NeurIPS) 2022 Workshop: Foundation Models for Decision Making*, **2022**.

[19] Z. Zhang, J. **Jin**, M. Jagersand, J. Luo, and D. Schuurmans, "A simple decentralized cross-entropy method," in *Advances in neural information processing systems (NeurIPS)*, vol. 34, pp. 29304–29320, **2022**.

[20] B. Rafiee, J. **Jin**, J. Luo, and A. White, "What makes useful auxiliary tasks in reinforcement learning: investigating the effect of the target policy," in *The 5th Multidisciplinary Conference on Reinforcement Learning and Decision Making*, RLDM, **2022**.

[21] D. Graves, N. M. Nguyen, K. Hassanzadeh, J. **Jin**, and J. Luo, "Learning robust driving policies without online exploration," in *2021 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 13186–13193, IEEE, **2021**.

[22] B. Xie, M. Han, J. **Jin**, M. Barczyk, and M. Jagersand, "A generative model-based predictive display for robotic teleoperation," in *2021 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 2407–2413, IEEE, **2021**.

[23] J. **Jin**, N. M. Nguyen, N. Sakib, D. Graves, H. Yao, and M. Jagersand, "Mapless navigation among dynamics with social-safety-awareness: a reinforcement learning approach from 2d laser scans," in *2020 IEEE international conference on robotics and automation (ICRA)*, pp. 6979–6985, IEEE, **2020**.

[24] J. **Jin**, L. Petrich, M. Dehghan, and M. Jagersand, "A geometric perspective on visual imitation learning," in *2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 5194–5200, IEEE, **2020**.

[25] J. **Jin**, L. Petrich, Z. Zhang, M. Dehghan, and M. Jagersand, "Visual geometric skill inference by watching human demonstration," in *2020 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 8985–8991, IEEE, **2020**.

[26] J. **Jin**, L. Petrich, M. Dehghan, Z. Zhang, and M. Jagersand, "Robot eye-hand coordination learning by watching human demonstrations: a task function approximation approach," in *2019 International Conference on Robotics and Automation (ICRA)*, pp. 6624–6630, IEEE, **2019**.

[27] M. Dehghan, Z. Zhang, M. Siam, J. **Jin**, L. Petrich, and M. Jagersand, "Online object and task learning via human robot interaction," in *2019 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 2132–2138, IEEE, **2019**.

[28] X. Qin, S. He, Z. Zhang, M. Dehghan, J. **Jin**, and M. Jagersand, "Real-time edge template tracking via homography estimation," in *2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 607–612, IEEE, **2018**.

Workshop Papers & Extended Abstracts:

[29] A. Ebrahimi and J. **Jin**, "Retrospective and structurally informed exploration via cross-task successor feature similarity," in *ICML Workshop on Exploration in AI Today*, 2025. Accepted May 2025, published July 2025.

[30] K. Sun, J. **Jin**, X. Chen, W. Liu, and L. Kong, "Reweighted bellman targets for continual reinforcement learning," in *ICML Workshop on Aligning Reinforcement Learning Experimentalists and Theorists*, 2024. Accepted June 2024, published July 2024.

[31] Q. Li, Y. Cao, J. Kang, T. Yang, X. Chen, J. **Jin**, and M. Taylor, "Laffi: Leveraging hybrid natural language feedback for fine-tuning language models," in *The 38th Annual AAAI Conference on Artificial Intelligence (AAAI 2024) Workshop: Human-Centric Representation Learning, ***Best Paper Runner-up****, 2024. Accepted Dec 2023, published Feb 2024.

[32] Y. Hu, J. **Jin**, and M. Tavakoli, "Learning medical skills by a robot from imperfect demonstrations," in *Alberta Robotics & Intelligent Systems Expo (RISE)*, (Edmonton, AB), 2024.

Patents

[33] D. M. Graves, J. **Jin**, and J. Luo, "Methods and systems for support policy learning," 2021. US Patent App. US20210357782A1. Pending.

[34] J. **Jin** and N. Du, "A precision mining system with gnss integration in autonomous open pit mining," 2016. China Patent App. CN104533528A. Granted. Google Patent Search Link.

[35] J. **Jin** and N. Du, "A geo-robot control system for structural health monitoring," 2015. China Patent App. CN103017824A. Granted. Google Patent Search Link.

Grants and Funding

Principal Investigator (PI) Grants

- **CFI JELF** – "Research Infrastructure for Human-level Robotic Manipulation Task Mastering", PI: Jun Jin Co-PI: Li Cheng 2025–2027
- **Government of Alberta (GoA) Matching Funds** – "Research Infrastructure for Human-level Robotic Manipulation Task Mastering", Project Leader: Jun Jin 2025–2027

- **Amii RAP (Research Award Program)** – "Recurrent Neural Agent Models: A Risky but High-Rewarding Way of Building Embodied AI for Robots", PI: Jun Jin 2025–2026
- **NSERC Discovery Grant** – "Modeling Embodied Dexterity for Open-ended Robot Learning", PI: Jun Jin 2024–2030
- **NSERC Discovery Launch Supplement** – "Modeling Embodied Dexterity for Open-ended Robot Learning", PI: Jun Jin 2024–2030
- **NSERC Alliance – Alberta Innovates Advance Program** – "Modeling Embodied Dexterity for Open-ended Robot Learning", PI: Jun Jin 2026–2028
- **University of Alberta, Faculty of Engineering Startup Fund**, PI: Jun Jin 2023–2027

Collaborative / Co-PI Grants

- **Department of National Defence IDEaS** – "Haptic Robot Manipulation with Sensitive Force and Torque Control through Semi-autonomous Manipulation Routines and Operator-in-the-loop Control", PI: Martin Jagersand Co-PIs: Alan Lynch, Ashique Rupam Mahmood, Jun Jin 2024–2025

Selected Leadership and Service

Co-organizer, ECCV 2026 Workshop: *How to Build Effective World Models for Embodied AI* 2026
Organizing Committee; Sponsorship Chair, Canadian AI/CRV 2026 2025–2026
Co-organizer, RISEx 2025 Tutorial Workshop: *Demystifying Embodied AI* 2025
Organizing Committee; Publicity & Communications Chair, AlbertaRISE 2024 2024

Invited Talks & Panels

Invited Seminars & Talks & Tutorials:

- *"Why General-Purpose Robots Cannot Be Pretrained: From Pretraining to Experience-Scaling Embodied AI,"* Invited Talk, **Amii Upper Bound 2026**, Edmonton, AB, May 2026.
- *"A Tutorial on Embodied AI from the Perspective of Action Generation,"* Invited Tutorial, CIFAR Deep Learning and Reinforcement Learning (DLRL) Summer School, Edmonton, AB, July 2025.
- *"A Blue Sky Talk: Virtual Cells and the Future of Data-Driven, Biologically Grounded Cell Simulations in Agri-Food Innovation,"* Invited Seminar, NSERC Canadian Agri-food Protein Training, Utilization, and Research Enhancement (CAPTURE) Workshop, Edmonton, AB, June 2025.
- *"Demystifying Embodied AI from the Perspective of Robot Motions,"* Invited Seminar, **Amii Upper Bound 2025**, Edmonton, AB, May 2025.
- Invited Research Talk, Keio University, Tokyo, Japan, July 2024.
- *"Seeking Unified Computational Models for Robotics,"* Invited Seminar, International Research Center for Neurointelligence (IRCN), The University of Tokyo, Tokyo, Japan, July 2024.

- *"Seeking Universal Computing Models for Robotics,"* Invited Talk, Amii Upper Bound 2024, Edmonton, AB, May 2024.
- *"A Rethink on Geometry, Robotic Reinforcement Learning, and Embodied AI,"* Invited Seminar, **ENSC Robotics Seminar, Simon Fraser University**, Burnaby, BC, May 2024.
- *"Seeking Universal Computing Models for Robotics,"* Invited Seminar, Visual Computing and Robotics Group Seminar, Simon Fraser University, Burnaby, BC, May 2024.

Panels:

- *"AI Reasoning Across Modalities and Immersive Collaboration,"* Panel Moderator, *Cross-Future AI Summit*, Vancouver, BC, July 2025.

Professional Experience

Staff Senior Researcher, Noah's Ark Lab, Huawei Technologies Canada 2021 – 2023
Vice Director, Department of Intelligent Systems, CHALIECO, China 2011 – 2016

Teaching Experience

- Faculty of Engineering, University of Alberta *Winter 2026, Fall 2026–future* **ENCMP 100 – Computer Programming for Engineers** Audience: first-year undergraduate engineering students. Serve as part of a coordinated flagship teaching team for this foundational course, introducing essential principles of computation and programming to the Faculty of Engineering in a high-impact classroom environment of approximately 280 students per section.
- Department of Electrical & Computer Engineering, University of Alberta *Commencing Fall 2026* **ECE 562 – Deep Reinforcement Learning for Robotics** Designed for students to master essential machine learning and reinforcement learning methods within a single semester. Covers mathematical foundations, supervised learning, neural networks and backpropagation, deep RL algorithms (value-based, policy-gradient, and actor–critic methods), model-based RL, inverse RL, temporal abstraction and options for skill discovery, and real-world RL applications in complex robotic systems.
- Faculty of Engineering, University of Alberta *Commencing Spring/Summer 2027* **MCTR 370 – Machine Learning for Mechatronics** Brand-new course developed for the first cohort of the Mechatronics and Robotics Engineering Cooperative Program. Bridges theoretical machine learning and practical robotics through modern ML topics, supervised, unsupervised, and reinforcement learning algorithms, and hands-on labs on training neural networks and deploying learned models on real robotic systems.
- Department of Electrical & Computer Engineering, University of Alberta *Fall 2023, Fall 2024, Fall 2025* **ECE 720 – Robot Learning: Principles and Advances** Creator and sole instructor of a graduate-level course on reinforcement learning, continual learning, and embodied AI for robotics. Developed innovative pedagogical activities (e.g., "Read & Share", "Think & Present") to foster critical discussion of state-of-the-art research and to strengthen students' ability to connect theory with frontier research problems. These initiatives improved classroom engagement and enhanced students' preparedness for independent research projects.

- Department of Electrical & Computer Engineering, University of Alberta *Capstone Project Supervision, 2024–2025* Supervised three capstone project groups (20+ students):
  - Group 25: EcoCar Driver Assist System.
  - Group 11: Dynamometer Data Acquisition Board.
  - Group 29: Smart-Home Bedside Charger and Light Switch.

  Guided project design, technical implementation, and final presentations. One group's project was ranked in the **top tier** at the final Capstone Project Day, evaluated by judges from a diverse panel of professional engineers and professors.

Mentoring and Advising

Current Graduate Students:

- Dalen Shi – PhD student, University of Alberta.
- Ji Huang – Incoming PhD student, University of Alberta (Fall 2026).
- Shelton Ge – PhD student, University of Alberta; main supervisor: Prof. Ming Lu; co-supervisor: Jun Jin.
- Hasan Ashraf – PhD student, University of Alberta; main supervisor: Prof. Ahmed Qureshi; co-supervisor: Jun Jin.
- Euijin Baek – PhD student, University of Alberta; main supervisors: Prof. Mi-Young Kim and Prof. Randy Goebel; co-supervisor: Jun Jin.
- Arya Ebrahimi – MSc student, University of Alberta.
- Daxton Dion-Hoffman – MSc student, University of Alberta.
- Megan Zhou – MSc student, University of Alberta; main supervisor: Prof. Mahdi Tavakoli; co-supervisor: Jun Jin.
- Kiarash Ghasemzadeh – MSc student, University of Alberta; main supervisor: Prof. Li Cheng; co-supervisor: Jun Jin.

Completed Graduate Students:

- Yi Hu – PhD, University of Alberta, February 2026. Transferred from Prof. Mahdi Tavakoli in February 2024 and continued PhD research in surgical robotics under my supervision. Thesis: *Surgical Robot Learning from Human Demonstrations.*
- Qianxi Li – MSc, University of Alberta; main supervisor: Prof. Matthew Taylor; co-supervisor: Jun Jin. Thesis: *Iterative Large Language Models Evolution through Self-Critique.*
- Zhouyiyang Yang – MEng, University of Alberta, Spring 2026. Capstone: *LoRA-based Fine-tuning of Pi-0.5 on Franka Panda: From Baseline Failure to Robust Manipulation.*
- Joyce Zhu – MEng, University of Alberta, Winter 2026. Capstone: *Why Do Neural Networks Forget: A Study of Collapse in Continual Learning.*

Undergraduate and High School Trainees:

- Logan Woudstra – Incoming summer intern, University of Alberta (2026).
- Landys Lepine – Fourth-year Computing Science student, University of Alberta; previous summer intern (2025).
- Hao Cheng – High school summer intern (2026).

Professional Service

Journal and grant proposal reviewer:

- Reviewer: ICRA, IROS, NeurIPS, ICML, ICLR (2019 – present). The 18th International Symposium on Experimental Robotics(ISER, 2023)
- Journal of Intelligent & Robotic Systems, IEEE Internet of Things Journal (2020). IEEE Transactions on Multimedia (2023).
- Peer Reviewer, Canada Foundation for Innovation (CFI), 2026
- Grant Reviewer, NSERC Computer Science Discovery Grants (2026)
- Grant Reviewer, Mitacs Accelerate (2025)

Workshop and tutorial organization:

- Co-organizer, *How to Build Effective World Models for Embodied AI*, Workshop at the European Conference on Computer Vision (ECCV 2026), 2026.
- Co-organizer with Dalen Shi, *Demystifying Embodied AI: Motion Generation, Architectures, and Open Challenges* (introductory tutorial on Embodied AI), Robotics & Intelligent Systems Expo (RISEx 2025), ECERF W2-090/110, University of Alberta, November 13, 2025.

Conference organization:

- Organizing Committee; Sponsorship Chair, Canadian AI/CRV 2026 (Canadian AI and Robots & Vision Conference), 2025–2026.
- Program Committee, 2nd Robotics & Intelligent Systems Expo (RISEx 2025), 2025.
- Organizing Committee; Publicity & Communications Chair, Alberta Robotics & Intelligent Systems Expo (AlbertaRISE 2024), 2024.

Departmental/University Service:

- Faculty Hiring Committee Member (2024–2025): Killam Memorial Chair in Robotics for Healthcare, University of Alberta.
- Faculty Hiring Committee Member (Fall 2025–Winter 2026): Mechatronics & Robotics faculty position, Department of Mechanical Engineering, University of Alberta.
- NSERC Discovery Grant (DG) Internal Reviewer (2025): Served as a faculty-level internal reviewer for the Faculty of Engineering, supporting the review of two Discovery Grant applications.

Memberships:

- IEEE Robotics & Automation Society (2019 – present)