Carl Qi

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Education

University of Texas at Austin August 2023 – Present
Ph.D. in Electrical & Computer Engineering **GPA: 4.0**

Carnegie Mellon University August 2021 – December 2022
M.S. in Machine Learning **GPA: 3.96**

University of California, Berkeley August 2017 – August 2021
B.A. in Computer Science, B.A. in Applied Mathematics **GPA: 3.976 (Summa Cum Laude)**

Industry Experience

Amazon Robotics Sunnyvale, CA
Applied Scientist Intern **May 2025 – August 2025**

- Fine-tuned large vision-language models (VLMs) to enhance robotic failure detection and reasoning
- Designed ARMOR, a self-refining algorithm that enables VLMs to iteratively improve their predictions by generating detection outcomes and natural language reasoning conditioned on prior outputs
- Achieved state-of-the-art performance with 30% improvement in failure detection rate and up to 100% gain in reasoning accuracy over baseline models; resulted in first-authored paper at ICLR 2026

UC Berkeley Electrical Engineering and Computer Science (EECS) Berkeley, CA
Instructor | CS188 – Intro to AI **June 2021 – August 2021**

- Gave 25 lectures on fundamental AI techniques such as reinforcement learning to 250+ students
- Recruited and led 20 staff members to develop course materials: 2 exams, 5 projects and 10 homework

Goldman Sachs New York City, NY
Quantitative Strategist Intern **July 2020 – August 2020**

- Undertook backend development in a digital storefront that delivers cross-asset access to global markets
- Developed 2 production-level endpoints that allowed investors to assess risk profile in various scenarios
- Integrated the endpoints with an open-source Python library that resulted in 100+ client visits per day

Research Experience

MIDI Lab, UT Austin Austin, Texas
Graduate Student Researcher **August 2023 – Present**

- Work with Prof. Amy Zhang on improving generalization of reinforcement learning algorithms

The Robotics Institute, Carnegie Mellon University Pittsburgh, PA
Graduate Student Researcher **August 2021 – June 2023**

- Worked with Prof. David Held on computer vision and machine learning for robotic manipulation
- Conducted research on policy training and long horizon reasoning for deformable object manipulation
- First authored multiple papers in major conferences and got media coverage in the Washington Post

Berkeley Artificial Intelligence Research (BAIR) Berkeley, CA
Undergraduate Student Researcher **April 2020 – April 2021**

- Worked with Prof. Pieter Abbeel and Prof. Aditya Grover on robust imitation learning

Selected Publications

[1] Carl Qi, Xiaojie Wang, Silong Yong, Stephen Sheng, Huitan Mao, Sriram Srinivasan, Manikantan Nambi, Amy Zhang, and Yesh Dattatreya. "Self-Refining Vision Language Model for Robotic Failure Detection and Reasoning". In: *Submitted to The Fourteenth International Conference on Learning Representations*. under review. 2026. URL: https://openreview.net/forum?id=jr9hGWQioP.

[2] Tal Daniel, Carl Qi, Dan Haramati, Amir Zadeh, Chuan Li, Aviv Tamar, Deepak Pathak, and David Held. "Latent Particle World Models: Self-supervised Object-centric Stochastic Dynamics Modeling". In: *Submitted to The Fourteenth International Conference on Learning Representations*. under review. 2026. URL: https://openreview.net/forum?id=lTaPtGiUUc.

[3] Dan Haramati, Carl Qi, Tal Daniel, Amy Zhang, Aviv Tamar, and George Konidaris. "Hierarchical Entity-centric Reinforcement Learning with Factored Subgoal Diffusion". In: *Submitted to The Fourteenth International Conference on Learning Representations*. under review. 2026. URL: https://openreview.net/forum?id=TimC6hxVHj.

[4] Carl Qi, Dan Haramarti, Tal Daniel, Aviv Tamar, and Amy Zhang. "EC-Diffuser: Multi-Object Manipulation via Entity-Centric Behavior Generation". In: *The Thirteenth International Conference on Learning Representations*. 2025. URL: https://openreview.net/forum?id=o3pJU5QCtv.

[5] Caleb Chuck, Fan Feng, Carl Qi, Chang Shi, Siddhant Agarwal, Amy Zhang, and Scott Niekum. "Null Counterfactual Factor Interactions for Goal-Conditioned Reinforcement Learning". In: *The Thirteenth International Conference on Learning Representations*. 2025.

[6] Caleb Chuck*, Carl Qi*, et al. "Robot Air Hockey: A Manipulation Testbed for Robot Learning with Reinforcement Learning". In: *CoRR* (2024).

[7] Carl Qi, Yilin Wu, Lifan Yu, Haoyue Liu, Bowen Jiang, Xingyu Lin, and David Held. "Learning Generalizable Tool-use Skills through Trajectory Generation". In: *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2024, pages 2847–2854. DOI: 10.1109/IROS58592.2024.10801653.

[8] Carl Qi, Xingyu Lin, and David Held. "Learning Closed-Loop Dough Manipulation Using a Differentiable Reset Module". In: *IEEE Robotics and Automation Letters* 7.4 (2022), pages 9857–9864. DOI: 10.1109/LRA.2022.3191239.

[9] Xingyu Lin*, Carl Qi*, Yunchu Zhang, Yunzhu Li, Zhiao Huang, Katerina Fragkiadaki, Chuang Gan, and David Held. "Planning with Spatial-Temporal Abstraction from Point Clouds for Deformable Object Manipulation". In: *6th Annual Conference on Robot Learning*. 2022. URL: https://openreview.net/forum?id=tyxyBj2w4vw.

[10] Carl Qi, Pieter Abbeel, and Aditya Grover. "Imitating, fast and slow: Robust learning from demonstrations via decision-time planning". In: *arXiv preprint arXiv:2204.03597* (2022).

Awards & Honors

Qualcomm Innovation Fellowship Finalist
Qualcomm **2023**

2nd Place Winner of East Coast Regional Datathon
Citadel Securities **2021**

2nd Place Winner in Cisco EN Hackathon
Cisco **2019**

2nd Place Winner in Sodahacks
University of California, Berkeley **2018**

1st Prize in Beijing High School Mechanics Contest
Chinese Society of Physics **2015**

Teaching

10-418/618: ML for Structured Data Carnegie Mellon University
TA **Spring 2022**

10-725: Convex Optimization Carnegie Mellon University
TA **Fall 2021**

CS188: Artificial Intelligence Univeristy of California, Berkeley
Instructor **Summer 2021**

CS188: Artificial Intelligence Univeristy of California, Berkeley
TA **Spring 2021**

CS188: Artificial Intelligence Univeristy of California, Berkeley
TA **Fall 2020**

CS188: Artificial Intelligence Univeristy of California, Berkeley
TA **Spring 2020**

CS188: Artificial Intelligence Univeristy of California, Berkeley
TA **Fall 2019**

Service

Reviewer IROS '24, ICLR '25, '26, RSS '25, NeurIPS '25