

Kevin Huang

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EDUCATION

University of Washington

Ph.D. in Computer Science – Robot Learning

October 2022 - present

California Institute of Technology (Caltech)

B.S. in Computer Science

GPA: 4.2

October 2018-June 2022

PUBLICATIONS/MANUSCRIPTS

Google Scholar ID: 9IQ0148AAAAJ

Kevin Huang*, Rosario Scalise*, Cleah Winston, and Yunchu Zhang, Rohan Baijal, Ayush Agrawal, Markus Grotz, Byron Boots, Abhishek Gupta. Using Non-Expert Data to Robustify Imitation Learning via Offline Reinforcement Learning. *Submitted to IEEE International Conference on Robotics and Automation (ICRA) 2025.*

Patrick Yin*, Tyler Westenbroek*, Simran Bagaria, **Kevin Huang**, Ching-an Cheng, Andrey Kobolov, Abhishek Gupta. Rapidly Adapting Policies to the Real World via Simulation-Guided Fine-Tuning. *Submitted to IEEE International Conference on Robotics and Automation (ICRA) 2025.*

Andrew Wagenmaker, **Kevin Huang**, Liyiming Ke, Byron Boots, Kevin Jamieson, Abhishek Gupta. Overcoming the Sim-to-Real Gap: Leveraging Simulation to Learn to Explore for Real-World RL. *Advances in Neural Information Processing Systems (NeurIPS), 2024*

Jake Sacks, Rwik Rana, **Kevin Huang**, Alex Spitzer, Guanya Shi, Byron Boots. Deep Model Predictive Optimization. *IEEE International Conference on Robotics and Automation (ICRA) 2023. arXiv:2310.04590*

Kevin Huang, Rwik Rana, Alex Spitzer, Guanya Shi, Byron Boots. DATT: Deep adaptive trajectory tracking for quadrotor control. *Conference on Robot Learning (CoRL) 2023. arXiv:2310.09053 (Oral presentation, 6.6% acceptance rate)*

Jermey Bernstein*, Chris Mingard*, **Kevin Huang**, Navid Azizan, Yisong Yue. Automatic Gradient Descent: Deep Learning without Hyperparameters. 2023. *arXiv:2304.05187*

Kevin Huang, Sahin Lale, Yuanyuan Shi, Ugo Rosalia, Anima Anandkumar. Cross Entropy Method with Gradient Descent for Model Based Reinforcement Learning, 2021. *arXiv:2112.07746*

Pablo Moscato, Mohammad Nazmul Haque, **Kevin Huang**, Julia Sloan, and Jonathon Corrales de Olivera . Learning to extrapolate using continued fractions: Predicting the critical temperature of superconductor materials, 2021. *Algorithms* 16 (8), 382. *arXiv:2012.03774*

RESEARCH EXPERIENCE

University of Washington *July 2023 – present*

WEIRD Lab (Advisor: Abhishek Gupta)

- Developed novel methods that allow imitation learning to leverage suboptimal data to significantly increase robustness to unknown situations. These allow for autonomous data collection from policy rollouts, providing a solution to the data flywheel for robot learning
- Developed a key insight into making sim2real finetuning of reinforcement learning policies fast and tractible - simulation can be used to teach a policy to *explore*, which when deployed on real, can rapidly adapt to a new environment with reinforcement learning
- Working on efficiently using large amounts of sim data to learn robotics world models that can rapidly adapt to unforeseen situations

University of Washington *October 2022 – present*

Robot Learning Lab (Advisor: Byron Boots)

- Researching using reinforcement learning to deploy intelligent robotic systems in complex, unstructured environments; as well as how to leverage both inductive biases/structure and data effectively in reinforcement learning
- Developed a novel reinforcement learning framework that leverages traditional adaptive control for state-of-the-art agile trajectory performance in quadrotor drones

California Institute of Technology *May 2021 – June 22*

Anima Anandkumar's Group

- Created a novel planner for model-based reinforcement learning by using gradient based optimization to obtain optimal action trajectories for an agent, as opposed to the current state of the art planners which are zeroth order optimizers that rely only on sampling trajectories. Our method achieves better sampling efficiency and scales better for environments with higher action space dimensionality.

California Institute of Technology *October 2020 - October 22*

Yisong Yue's Group

- Developed the theory of deep relative trust, a new model of optimization tailored to deep neural networks. Developing a trust region that takes into account the structure of neural networks, and establishing its connection to the well-studied mirror descent.
- Using this theory to develop a novel optimization algorithm for tailored specifically to neural networks.

University of Newcastle, Newcastle

March 2020 – October 2020

Pablo Moscato's Group

- Developing and improving a new method of symbolic regression with memetic algorithms using a continued fraction representation. Tested on a variety of applications, from predicting critical temperatures for superconducting materials to predicting dates that a Shakespeare play was written.

California Institute of Technology

June 2019 - September 2019

David Van Valen's Group

- Contributed to DeepCell, a deep learning python framework for biological analysis, especially cell segmentation

WORK EXPERIENCE

Virtualitics, Inc.

Data Scientist Intern

December 2021 – August 2022

- Led research project on developing a novel visualization framework for critical regions of interest in high dimensional tabular datasets

TEACHING EXPERIENCE

California Institute of Technology, CA

Teaching Assistant

- CS 1: Introduction to Programming *Fall 2019, Fall 2020, Fall 2021*
- CS 4: Fundamentals of Computer Programming *Winter 2020-2021*

HONORS AND AWARDS

Arthur R. Adams SURF Fellow – Caltech Research Fellowship

U.S.A. Computing Olympiad Platinum Division 2018