

Kevin Huang

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EDUCATION

University of Washington

October 2022 - present

Ph.D. in Computer Science – Machine Learning and Robotics

California Institute of Technology (Caltech)

October 2018-June 2022

B.S. in Computer Science

GPA: 4.2

PUBLICATIONS/MANUSCRIPTS

Jake Sacks, Rick Rana, **Kevin Huang**, Alex Spitzer, Guanya Shi, Byron Boots. Deep Model Predictive Optimization. *Submitted to 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

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.
- Proposed a novel regression model and algorithm that combines continued fractions along with traditional spline models to create smooth out-of-domain predictions. 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
- Designed and adapted convolutional neural network architectures for various problem domains, including 3D cell segmentation and augmented microscopy. Models were built using Tensorflow and deployed on Google Cloud.

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