Kevin Huang

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EDUCATION

California Institute of Technology (Caltech) *October 2018-June 2022*
B.S. in Computer Science
GPA: 4.2 (A = 4.0; A+ = 4.3)

RESEARCH EXPERIENCE

California Institute of Technology, CA *May 2021 - present*
Anima Anandkumar's Group

- Creating 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, CA *October 2020 - present*
Yisong Yue's Group

- Developing 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, Australia *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, CA *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.

EMPLOYMENT EXPERIENCE

Virtualitics, Inc. *December 2021 - present*

Data Science Intern

- Working with clients to develop predictive models

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*

SUBMITTED WORKS

Kevin Huang, Sahin Lale, Ugo Rosalia, Yuanyuan Shi, and Anima Anandkumar. CEM-GD: Cross Entropy Method with Gradient Descent for Model Based Reinforcement Learning, 2021. Submitted to *Learning for Dynamics & Control* (L4DC). *https://arxiv.org/abs/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. Submitted to *IEEE Transactions on Artificial Intelligence. arXiv:2012.03774*

HONORS AND AWARDS

Arthur R. Adams SURF Fellow – Caltech Research Fellowship

Cecil B. DeMille Endowed Scholarship

Mathes Scholarship

U.S.A. Computing Olympiad Platinum Division

SELECTED COURSEWORK/SKILLS

Computer Programming (Python, R, Matlab, Java, C, C++), Computer Systems, GPU Programming, Probability, Statistics, Linear Algebra, Bayesian Statistics, Markov Chains and Stochastic Processes, Statistical Machine Learning, Deep Learning, Computer Vision, Optimization Theory, & Quantum Mechanics