

Kyle Hatch

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RESEARCH INTERESTS

Robot Learning, Imitation Learning, Offline Reinforcement Learning, Model-based Reinforcement Learning

EDUCATION

Stanford University

M.S. in Computer Science
Artificial Intelligence Track
Coterminal Master's Program

Stanford, CA

Graduated: June 2023
GPA: 4.05

Stanford University

B.S. with honors in Computer Science
Artificial Intelligence Track

Stanford, CA

Graduated: June 2022
GPA: 3.78

Relevant Courses Taken

CS 239: Advanced Topics in Sequential Decision Making (A+); CS 332: Advanced Survey of Reinforcement Learning (A); MS&E 338: Reinforcement Learning: Frontiers (A); CS 234: Reinforcement Learning (A); CS 330: Deep Multi-task and Meta Learning (A); CS 228: Probabilistic Graphical Models: Principles and Techniques (A); CS 231N: Convolutional Neural Networks for Visual Recognition (S*); CS 224N: Natural Language Processing with Deep Learning (A); CS 224U: Natural Language Understanding (A); CS 238: Decision Making Under Uncertainty (A); CS 224W: Machine Learning with Graphs (A-); CS 361: Engineering Design Optimization (A); CS 221: Artificial Intelligence: Principles and Techniques (A); CS 205L: Continuous Mathematics with an Emphasis on Machine Learning (A+); MATH 104: Applied Matrix Theory (A); CS 110: Principles of Computer Systems (A)

* Letter grades not offered during the Spring 2020 quarter due to the COVID-19 pandemic.

Honors/Awards

Completed undergraduate CS Honors thesis.

PUBLICATIONS

Under Review

Rafailov, R.*, **Hatch, K. B.***, Singh, A., Smith, L., Kumar, A., Kostrikov, I., Hansen-Estruch, P., Koley, V., Ball, P., Wu, J., Finn, C., and Levine, S., "D5RL: Diverse Datasets for Data-Driven Deep Reinforcement Learning," *International Conference on Learning Representations (ICLR)*, 2024.

Published/Accepted

Rafailov, R.*, **Hatch, K. B.***, Koley, V., Martin, J., Phielipp, M., and Finn, C., "MOTO: Offline to Online Fine-tuning for Model-Based Reinforcement Learning," *Conference on Robot Learning (CoRL)*, 2023.

[PDF](#)

Hatch, K. B., Eysenbach, B., Yu, T., Rafailov, R., Salakhutdinov, R., Levine, S., and Finn, C., "Contrastive Example-Based Control," *Learning for Dynamics & Control Conference (L4DC)*, 2023. [PDF](#) [Website](#)

Zhou, G., Dean, V., Srirama, M. K., Rajeswaran, A., Pari, J., **Hatch, K. B.**, Jain, A., Yu, T., Abbeel, P., Pinto, L., Finn, C., and Gupta, A., "Train Offline, Test Online: A Real Robot Learning Benchmark," *2023 IEEE International Conference on Robotics and Automation (ICRA)*, 2023. [Website](#)

Mern, J., **Hatch, K.**, Silva, R., Hickert, C., Sookoor, T., and Kochenderfer, M. J., "Autonomous Attack Mitigation for Industrial Control Systems," *International Conference on Dependable Systems and Networks (DSN'22)*, 2022. [PDF](#)

Senanayake, R.*, **Hatch, K.***, Zheng, J., and Kochenderfer, M. J., "3D Radar Velocity Maps for Uncertain Dynamic Environments," *IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2021. [PDF](#) [Presentation](#)

Hatch, K., Mern, J., and Kochenderfer, M. J., "Obstacle Avoidance Using a Monocular Camera," *AIAA SciTech Forum*, 2021. [PDF](#) [Presentation](#)

***denotes equal contribution**

RESEARCH EXPERIENCE

Toyota Research Institute (TRI)

AI Resident in the Machine Learning Division

July 2023 – Present

Researching how to leverage Internet scale video data for robot learning. Videos of humans interacting with objects are available on a massive scale on the Internet, but this type of data does not contain the action labels needed to directly train a robot policy. Currently developing a hierarchical imitation learning-based approach that trains a high-level policy on action-free video data to output subgoals, which can then be reached by a low-level robot policy.

Stanford IRIS Lab – Prof. Chelsea Finn

Undergraduate/Master's student

October 2020 — June 2023

Worked on addressing three key limitations in scaling offline RL methods to realistic robot applications: 1) learning from play data/autonomously collected robot data without reward labels 2) pretraining on offline data and then finetuning online 3) developing realistic simulated benchmarks. Three first/co-first author publications:

- D5RL: a simulated robotics benchmark to evaluate offline RL methods on visually diverse, realistic simulated robotics tasks. Co-first author on paper under review at the International Conference on Learning Representations (ICLR) 2024.
- MOTO: a model-based RL method designed for efficient offline-to-online finetuning for vision-based manipulation tasks. Co-first author on paper in the Conference on Robot Learning (CoRL) 2023.
- LAEO: an offline reinforcement learning method using contrastive learning for data without reward labels. First author on paper in the Learning for Dynamics & Control Conference (L4DC) 2023 conference.

Stanford Intelligent Systems Laboratory (SISL) – Prof. Mykel Kochenderfer

Undergraduate student

June 2019 — March 2021

Worked on using machine learning and RL techniques to improve collision avoidance in autonomous vehicles and UAVs. Two first/co-first author publications:

- A method to learn 3D velocity maps from radar data for use by autonomous vehicles. Co-first author on paper in the IEEE International Conference on Intelligent Robots and Systems (IROS) 2021 conference.
- A collision avoidance system for autonomous drones using monocular vision and deep reinforcement learning.

ment learning. First author on paper in the American Institute of Aeronautics and Astronautics (AIAA) SciTech Forum 2021 conference.

Johns Hopkins University Applied Physics Laboratory (APL)

Research Intern

June 2020 — May 2021

Developed a reinforcement learning based method to autonomously respond to cybersecurity threats on industrial control systems. Second author on paper in the International Conference on Dependable Systems and Networks (DSN'22), 2022.

Stanford Network Analysis Project (SNAP) – Prof. Jure Leskovec

Undergraduate student

September 2019 — June 2020

Conducted research on using graph convolutional networks to predict interactions between microbes in the human gut.

VOLUNTEER WORK

East Palo Alto Stanford Academy (EPASA)

Volunteer tutor

Stanford, CA

October 2018 – March 2020

Tutored seventh and eighth grade students in mathematics and English.

Stanford 1st Ward Volunteer Tutoring Program

Volunteer tutor

Stanford, CA

September 2017 – June 2019

Tutored K-12 students in mathematics, reading, and English.

KEY SKILLS

Machine Learning Frameworks

JAX, Pytorch, Tensorflow 2.0

Reinforcement Learning Tools

deepmind-acme, TF-Agents, RLkit, JAXRL

Network Analysis Tools

NetworkX, SNAP.py

Simulation Tools

Mujoco, Microsoft AirSim

Programming Languages

Python, C++