

# Kyle Hatch

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## RESEARCH INTERESTS

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

## EDUCATION

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### 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

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### 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

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### 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 reinforcement learning 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 benchmark to evaluate offline RL and offline-to-online finetuning 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 reinforcement learning 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.

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

*Undergraduate student*

*June 2019 — March 2021*

Worked on using machine learning and reinforcement learning 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.
- A collision avoidance system for autonomous drones using monocular vision and deep reinforcement learning. First author on paper in the American Institute of Aeronautics and Astronautics

(AIAA) SciTech Forum 2021.

### **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**

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### **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**

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### **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++