

# Kyle Hatch

✉ [khatch@stanford.edu](mailto:khatch@stanford.edu) • 🌐 [khatch31.github.io](https://github.com/khatch31)

## RESEARCH INTERESTS

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Offline Reinforcement Learning, Model-Based Reinforcement Learning, Meta Learning, Robotics

## EDUCATION

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### Stanford University

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

Stanford, CA

Expected Graduation: June 2023  
GPA: 4.08

### Stanford University

B.S. in Computer Science  
Artificial Intelligence Track

Stanford, CA

Graduated: June 2022  
GPA: 3.78

### Relevant Courses Taken

CS 332: Advanced Survey of Reinforcement Learning (A); MS&E 338: Reinforcement Learning: Frontiers (A); CS 239: Advanced Topics in Sequential Decision Making (A+); CS 330: Deep Multi-task and Meta Learning (A); CS 234: Reinforcement Learning (A); CS 238: Decision Making Under Uncertainty (A); CS 231N: Convolutional Neural Networks for Visual Recognition (S\*); CS 224N: Natural Language Processing with Deep Learning (A); CS 224W: Machine Learning with Graphs (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.\***, Kolev, V., Martin, J., Phielipp, M., and Finn, C., "MOTO: Offline to Online Fine-tuning for Model-Based Reinforcement Learning," *International Conference on Machine Learning (ICML)*, 2023.

### Published/Accepted

**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 \(link to NeurIPS workshop version\)](#)

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](#)

### Workshop Papers

**Hatch, K. B.**, Shetty, S. J., Eysenbach, B., Yu, T., Rafailov, R., Salakhutdinov, R., Levine, S., and Finn, C., "Contrastive Example-Based Control," *NeurIPS 2022 Offline RL and Deep RL workshops*, 2022. [PDF](#) [Presentation](#)

Mern, J., Krishnan, S., Yildiz, A., **Hatch, K.**, and Kochenderfer, M. J., "Interpretable Local Tree Surrogate Policies," *The AAAI Workshop on Artificial Intelligence Safety 2022 (SafeAI)*, 2022. [PDF](#)

**Hatch, K.\***, Yu, T.\*, Rafailov, R., and Finn, C., "Example-Based Offline Reinforcement Learning without Rewards," *NeurIPS Offline RL Workshop*, 2021. [PDF](#)

\*denotes equal contribution

## REVIEWING

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### Journal of Aerospace Information Systems

April 2020, July 2020, October 2020, December 2020

<https://publons.com/researcher/3557128/kyle-hatch/>

## RESEARCH EXPERIENCE

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### Stanford IRIS Lab – Prof. Chelsea Finn

*October 2020 – Present:* Developing an offline reinforcement learning method using contrastive learning for data without reward labels. First author on the paper on this project that is under review at the Learning for Dynamics & Control Conference (L4DC) 2023 conference. Also developing a model-based RL method designed for efficient offline-to-online finetuning for vision-based manipulation tasks. Co-first author on a paper on this project that is under review at the International Conference on Machine Learning (ICML) 2023.

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

*June 2019 – June 2020:* Developed a collision avoidance system for autonomous drones using monocular vision and deep reinforcement learning. First author on the paper we published on this project in the American Institute of Aeronautics and Astronautics (AIAA) SciTech Forum 2021 conference.

*August 2020 – March 2021:* Developed a method to learn 3D velocity maps from radar data for use by autonomous vehicles. Co-first author on the paper we published on this project in the IEEE International Conference on Intelligent Robots and Systems (IROS) 2021 conference.

### Johns Hopkins University Applied Physics Laboratory (APL) – Critical Infrastructure Protection Group (QNI), Asymmetric Operations Sector

*June 2020 – May 2021:* Developed a reinforcement learning based method to autonomously respond to cybersecurity threats on industrial control systems. Second author on the paper we published on

this project in the International Conference on Dependable Systems and Networks (DSN'22), 2022.

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

*September 2019 – June 2020:* Conducted research on using graph convolutional networks to predict interactions between microbes in the human gut.

## **CLASS PROJECTS**

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**MS&E 338:** Improved the exploration efficiency of Randomized Ensembled Double Q-Learning ([Chen, Wang, Zhou et al., 2021](#)) by combining it with Q-ensemble based UCB exploration ([Chen et al, 2017](#)).

**CS 239:** Wrote a review on Monte Carlo Tree Search methods that incorporate learned policies and value functions.

**CS 224N:** Developed a natural language instruction following RL agent that can ask for clarification on ambiguous instructions.

**CS 330:** Adapted the Variational Inverse Control with Events (VICE) algorithm for use in multi-task settings.

**CS 234:** Developed a multi-agent reinforcement learning system for multiple agents to learn to cooperatively collect resources in a grid world.

**CS 231N:** Developed a smaller version of the U-Net architecture to segment MRI scans of brain tumors with less computational cost.

**CS 224W:** Used graph embedding algorithms to predict interactions between human gut bacteria.

**CS 238:** Implemented Deep Q-Learning to control an agent in an artificial life simulation.

**CS221:** Trained neural networks to predict human walking gait patterns based on measurements from wearable sensors.

## **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**

### **Reinforcement Learning Frameworks**

### **Network Analysis Tools**

### **Simulation Tools**

### **Programming Languages**

JAX, Tensorflow, Pytorch, Pytorch Geometric

deepmind-acme, TF-Agents, RLkit, JAXRL2

NetworkX, SNAP.py

Microsoft AirSim, Mujoco

Python, C++