

# Kyle Hatch

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## 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

### Honors/Awards

Completed undergraduate CS Honors thesis.

## RESEARCH EXPERIENCE

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**Research Focuses:** Robot Learning, Reinforcement Learning, Foundation Models

### Toyota Research Institute (TRI)

*AI Resident in the Machine Learning Division*

*July 2023 – Present*

Research focuses on leveraging foundation models for robot learning. Leading a project on utilizing pre-trained, language-conditioned image diffusion models to generate subgoals for long-horizon, robotic manipulation tasks. Our approach involves fine-tuning large vision-language models (VLMs) on action-free, Internet-scale human video data. Developing key skills for large-scale robot learning, such as structuring data loaders and models for multi-node, distributed training, and using large-scale computing platforms.

### 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) pre-training on offline data and then fine-tuning online 3) developing realistic simulated benchmarks. Three first/co-first author publications:

- D5RL: a benchmark to evaluate offline RL and offline-to-online fine-tuning 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 fine-tuning 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 unmanned aerial vehicles UAVs. Two first/co-first author publications:

- A method to learn 3D velocity maps from radar data for 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 gastrointestinal tract.

## PUBLICATIONS

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### Published/Accepted

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," *Conference on Robot Learning (CoRL)*, 2023.

[PDF](#) [Website](#)

**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. [PDF](#) [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," *American Institute of Aeronautics and Astronautics (AIAA) SciTech Forum*, 2021. [PDF](#) [Presentation](#)

### Under Review

Rafailov, R.\*, **Hatch, K. B.\***, Singh, A., Smith, L., Kumar, A., Kostrikov, I., Hansen-Estruch, P., Kolev, 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.

**\*denotes equal contribution**

## OUTREACH

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### **Breakthrough Silicon Valley (BTSV)**

*Volunteer tutor*

**San Jose, CA**

*November 2023 – Present*

Provide homework support to high school students who are on track to becoming first-generation college students. Primarily assist with mathematics.

### **East Palo Alto Stanford Academy (EPASA)**

*Volunteer tutor*

**Stanford, CA**

*October 2018 – March 2020*

Provided homework support to seventh and eighth grade students from low-income backgrounds in mathematics and English, and helped students to develop effective study skills.

### **Stanford 1st Ward Volunteer Tutoring Program**

*Volunteer tutor*

**Stanford, CA**

*September 2017 – June 2019*

Provided homework support to K-12 students in mathematics, reading, and English.

## SKILLS

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### **Machine Learning Frameworks**

JAX, Pytorch, Tensorflow 2.0

### **Cloud Computing**

Amazon SageMaker

### **Reinforcement Learning Tools**

deepmind-acme, TF-Agents, RLkit, JAXRL

### **Simulation Tools**

Mujoco, Microsoft AirSim

### **Programming Languages**

Python, C++