Kyle Hatch

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EDUCATION

Stanford University | **Stanford, CA**
M.S. in Computer Science | *Graduated: June 2023*
Artificial Intelligence Track | *GPA: 4.05*
Coterminal Master's Program

Stanford University | **Stanford, CA**
B.S. with honors in Computer Science | *Graduated: June 2022*
Artificial Intelligence Track | *GPA: 3.78*

Honors/Awards
Completed undergraduate CS Honors thesis.

RESEARCH EXPERIENCE

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) 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 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

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

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

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

Breakthrough Silicon Valley (BTSV)   **San Jose, CA**
Volunteer tutor   *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)   **Stanford, CA**
Volunteer tutor   *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   **Stanford, CA**
Volunteer tutor   *September 2017 – June 2019*

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

SKILLS

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++