Kathy Jang

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Education

University of California, Berkeley **Aug 2019 – May 2024**
Ph.D., Department of EECS., Advised by Prof. Alexandre Bayen

University of California, Berkeley **Aug 2014 – May 2018**
B.A., Computer Science

Experience

U.C. Berkeley Ph.D. Student, Department of EECS **Aug 2019 - present**

- Researching multi-agent reinforcement learning algorithms and robustness for efficient autonomous vehicle (AV) driving policies as part of the CIRCLES consortium, which deployed 100 AVs onto a real highway in 2023. Performed robustness analysis, directed intermediary physical transfers onto AVs, wrote code to enable transfer from neural net to vehicle.
- Led a project for a collaboration with Toyota, exploring RL as a controller for autonomous vehicles at intersections and examining the effect via penetration analysis.
- Researched methods of developing robust, generalizable RL algorithms for policy transfer, for AV control. Developed an end-to-end system including development of the RL policies and deployment onto the physical robotic system (a Turtlebot). Exploring methods of position-based, as well as vision-based training (and perturbation).

Toyota Infotech Labs **June 2022 – Aug 2022**

- Researched deep RL techniques for wave attenuation caused by lane changes and human feedback in freeway traffic, designed simulator, performed data analysis. Demonstrated 16% improvement from baselines.

Lawrence Berkeley National Laboratory **Jan 2019 – Aug 2019**

- Researched optimal control via deep reinforcement learning methods with a focus on energy and environmental analysis.

Berkeley Artificial Intelligence Research Lab (BAIR) **Aug 2017 – Jan 2019**

- Used deep RL techniques to train controllers for autonomous vehicles and demonstrate their ability to decrease traffic congestion, with emphasis on zero-shot policy transfer of simulated policies to the physical domain.
- Developed open-source framework Flow for traffic flow optimization via RL, with demonstrated improvements in average velocity, at https://github.com/flow-project

Intel Corporation **May 2017 – Aug 2017**

- Drove cloud solutions for cloud service providers Baidu and Salesforce to achieve full data center automation.
- Analyzed customer data and simulated data to develop trained machine learning models for SSD and DIMM failure prediction, using correlation and Markov models.

Awards & Scholarships

- National Science Foundation Graduate Research Fellowship (NSF) (2020), Dwight David Eisenhower Fellowship (2021), Diversity & Inclusion Scholarship (2019), Berkeley EECS Excellence Award 19-20, Recurse Center Winter 2019 Fellowship, Dean's Honors Fall 2014, The Leadership Scholarship (2014)

Selected Publications

- **Simulation to scaled city: zero-shot policy transfer for traffic control via autonomous vehicles.** Kathy Jang, Eugene Vinitsky, Behdad Chalaki, Ben Remer, Logan Beaver, Andreas Malikopoulos, Alexandre Bayen. International Conference on Cyber Physical Systems (ICCPS) 2019.
- **Zero-Shot Autonomous Vehicle Policy Transfer: From Simulation to Real-world via Adversarial Training.** Behdad Chalaki, Logan Beaver, Ben Remer, Kathy Jang, Eugene Vinitsky, Alexandre Bayen, Andreas Malikopoulos. Finalist for Best Paper, International Conference on Control and Automation (ICCA) 2020.
- **Robust Reinforcement Learning using Adversarial Populations.** Eugene Vinitsky, Kanaad Parvate, Yuqing Du, Kathy Jang, Alexandre Bayen, Pieter Abbeel. In submission at ICLR 2020.
- **Traffic Smoothing Controllers for Autonomous Vehicles Using Deep Reinforcement Learning and Real-World Trajectory Data.** Nathan Lichtlé, Kathy Jang, Adit Shah, Eugene Vinitsky, Jonathan W. Lee, Alexandre M. Bayen. Intelligent Transportation Systems Conference (ITSC) 2024.
- Reinforcement Learning Based Oscillation Dampening: Scaling up Single-Agent RL algorithms to a 100 AV highway field operational test. Kathy Jang, Nathan Lichtlé, Eugene Vinitsky, Adit Shah, Matthew Bunting, Matthew Nice, et al. Control Systems Magazine (CSM) 2024.