

Albert Wilcox

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Education

Georgia Institute of Technology - Atlanta, GA <i>Ph.D. in Computer Science</i> (focus in ML + Robotics)	Aug 2023 - Present Advised by Prof. Animesh Garg
University of California, Berkeley - Berkeley, CA <i>M.S. in Electrical Engineering and Computer Science</i>	Aug 2022 - May 2023 Advised by Prof. Ken Goldberg
University of California, Berkeley - Berkeley, CA <i>B.A. in Computer Science, Applied Mathematics</i>	Aug 2018 - May 2022 Advised by Profs Ken Goldberg, Kris Pister

Work Experience

Nuro - *Software Engineering Intern* June 2022 - Aug 2022

- Worked on the **machine learning research** team, using epistemic uncertainty estimates to improve the RL planner.
- Developed a novel RL method leading to a **22.5% decrease** in simulated collision rate.
- Built scalable, high-performing Tensorflow-based RL algorithm implementations using Python and C++.

Amazon Web Services - *Software Development and Engineering Intern* May 2020 - Aug 2020

- Built a data lake to store data emitted by AWS Elastic Load Balancers using a variety of AWS tools.

Research Experience

People, AI, and Robots Group - *Advised by Prof. Animesh Garg* Aug 2023 - Present

- Studying generative modeling, imitation learning and reinforcement learning with applications to robotics.

Berkeley AI Research - AUTOLab - *Advised by Prof. Ken Goldberg* Aug 2020 - May 2023

- Research areas include reinforcement learning, imitation learning, and computer vision applied to real robots.

UC Berkeley Autonomous Microsystems Lab - *Advised by Prof. Kris Pister* Aug 2019 - May 2020

- Designed and implemented algorithms for accurate long-horizon dynamics model learning for model-based RL.

Selected Publications

QueST: Quantized Skill Transformer

- Novel multitask and fewshot behavior cloning algorithm using a causally masked convolutional neural network and transformer to tokenize robot action sequences and a GPT-style transformer to predict expert action tokens.
- State of the art task success rates for multitask and fewshot settings, including a 27% improvement over the next best baseline in fewshot LIBERO-10, a popular robot learning benchmark.
- Third author on 2024 preprint (<https://arxiv.org/abs/2407.15840>).

MCAC: Monte Carlo Augmented Actor Critic

- An easy-to-implement change that can be applied to any off-policy actor-critic algorithm to stabilize and speed up sparse reward reinforcement learning from demonstrations.
- Speeds up learning across the board when combined with common RL algorithms (SAC, TD3) and stabilized online learning when combined with offline RL algorithms.
- First author on paper presented at the **2022 Conference on Neural Information Processing Systems (NeurIPS)**.

LS³: Latent Space Safe Sets

- A novel reinforcement learning algorithm for safe and efficient RL from image observations using a small set of human demonstrations to structure exploration and reason about safety.
- Improved task completion rate by as much as 28% over the next best prior algorithm while maintaining constraint satisfaction throughout learning for simulated robotics tasks.
- First author on a paper presented at the **2021 Conference on Robot Learning (CoRL)**.

Skills

Areas

Reinforcement Learning ◦ Imitation Learning ◦ Robotics ◦ Generative Modeling ◦ Representation Learning ◦ Computer Vision ◦ Transformers

Technologies

TensorFlow ◦ PyTorch ◦ Keras ◦ NumPy ◦ PyPlot ◦ Python ◦ Java ◦ C ◦ MATLAB ◦ Ruby ◦ L^AT_EX