

Xuanlin (Simon) Li

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EDUCATION

University of California - San Diego

PhD in Computer Science and Engineering, 2021 - now
Advisor: Prof. Hao Su

University of California - Berkeley

B.A. Computer Science (honors) & Mathematics (honors), 2017-2021
Technical GPA: 4.0

EXPERIENCE

- UC San Diego Center for Visual Computing & Contextual Robotics Institute** La Jolla, CA
PhD Student & Researcher Sep 2021 - Now
 - Advised by Prof. Hao Su. Current research areas include embodied AI, vision-based (3D point cloud / 2D image) robot manipulation skill learning, joint vision-language representation learning, and large-scale reinforcement learning.
- Berkeley Artificial Intelligence Research** Berkeley, CA
Undergraduate Researcher Mar 2019 - May 2021
 - Advised by Prof. Trevor Darrell. Worked on non-monotonic sequence generation on vision & language tasks (e.g., image captioning and machine translation), reinforcement learning, and neural network architecture learning.

HONORS AND AWARDS

- Jacobs School of Engineering PhD Fellowship, UC San Diego, 2021
- Arthur M. Hopkin Award, UC Berkeley EECS, 2021

PUBLICATIONS (* = EQUAL CONTRIBUTION)

- Frame Mining - A Free Lunch for Learning Robotic Manipulation from 3D Point Clouds** CoRL 2022
M. Liu*, **X. Li***, Z. Ling*, Y. Li, H. Su
3D point clouds can be represented in different coordinate frames (systems) without changing camera placements or requiring extra camera views. We find that choices of coordinate frames have a profound impact on robotic manipulation learning from 3D point clouds, and we propose FrameMiners to adaptively fuse coordinate frames, significantly improving learning performance & efficiency.
- ManiSkill2: A Unified Benchmark for Generalizable Manipulation Skills** In Submission.
J Gu*, F Xiang*, Z. Ling*, X. Wei*, X. Liu*, **X. Li***, R. Chen*, S. Tao*, T. Mu*, P. Xie*, Y. Yao*, Y. Tang, X. Yuan, Z. Huang, H. Su
- ManiSkill: Generalizable Manipulation Skill Benchmark with Large-Scale Demonstrations** Neurips 2021 (Dataset & Benchmarks Track)
T. Mu*, Z. Ling*, F Xiang*, D. Yang*, **X. Li***, S. Tao, Z. Huang, Z. Jia, H. Su
SAPIEN Manipulation Skill Benchmarks (1&2), which cover stationary/mobile-base, single/dual-arm, and rigid/soft-body manipulation tasks with 2D/3D-input data simulated by fully dynamic engines. My primary contributions include building and verifying rigid-body environments along with benchmarking 3D point cloud & RGBD-based manipulation learning algorithms.
- Discovering Non-Monotonic Autoregressive Orderings with Variational Inference** ICLR 2021
X. Li*, B. Trabuccion*, D.H. Park, Y. Gao, M. Luo, S. Shen, T. Darrell
We propose a novel unsupervised approach for efficiently learning non-monotonic sequence generation orders across vision and language tasks purely from training data - no domain knowledge required. Empirical results demonstrate that our method is context-aware and discovers orderings that are even better than fixed orders (e.g. left-to-right).
- Improving Policy Optimization with Generalist-Specialist Learning** ICML 2022
Z. Jia, **X. Li**, Z. Ling, S. Liu, Y. Wu, H. Su
We propose a novel generalist-specialist learning framework and a well-principled meta-algorithm for large-scale Reinforcement Learning (RL). We show that our framework pushes the envelope of policy learning on many challenging and popular benchmarks including Procgen, Meta-World and ManiSkill.
- Regularization Matters in Policy Optimization - An Empirical Study on Continuous Control** ICLR 2021 (Spotlight)
Z. Liu*, **X. Li***, B. Kang, T. Darrell
We show that conventional regularization techniques in supervised learning can be robustly helpful in policy optimization on continuous control tasks. We also analyze why they can help policy generalization from sample complexity, return distribution, weight norm, and noise robustness perspectives.

TECHNICAL SKILLS

- Languages:** Python, Java, C/C++, Bash, LaTeX, Golang, HTML/CSS
- Libraries / Softwares:** PyTorch, Tensorflow, Numpy/Scipy/Pandas/Matplotlib, Jax, Scikit-learn, Trimesh/Open3D, Blender
- Developer Tools:** Git, Docker, Kubernetes, Vim, VSCode
- Selected CourseWork:**
 - Graduate: Computer Vision, ML for 3D Geometry, Deep Unsupervised Learning, ML for Robotics, Deep Reinforcement Learning, Advanced Robotics, Natural Language Processing, Theoretical Statistics, Topology and Real Analysis, Functional Analysis
 - Undergraduate: Machine Learning, Operating Systems, Probability Theory and Random Processes, Optimization, Algorithms, Data Structures, Machine Structures, Real Analysis, Linear Algebra, Abstract Algebra, Complex Analysis, Numerical Analysis, Differential Geometry, PDE