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*
  - Primary interests: **Embodied AI, Vision-Language, Robotics**.
  - My major research interests include (1) building vision-language models and robotic agents with universal, open-world (2D & 3D) perception and reasoning capabilities that can be efficiently and effectively deployed for real world applications; (2) scaling up robotic training data, learning-from-demonstration algorithms, and benchmarks for generalizable and robust robotic manipulation in the real world.
  - Major open-source contributions: SAPIEN Manipulation Skill Challenge (ManiSkill); Evaluating Real-World Robot Manipulation Policies in Simulation (Simpler-Env).
- **Hillbot.ai** — San Diego, CA
  Research Intern — *Year-Round*
  - Open-world robotic manipulation and navigation system.
- **Boston Dynamics AI Institute** — Cambridge, MA
  Research Intern — *Jun 2024 - Sep 2024*
  - Generalizable vision-based bimanual contact-rich manipulation.
- **Qualcomm AI Research** — San Diego, CA
  Research Intern — *Mar 2023 - Sep 2023*
  - Worked on situated real-time interactions with large language models through multimodal (vision-audio) stream conditioning.
- **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, reinforcement learning, and neural network architecture learning.

Publications and Projects (* = equal contribution)

As of Aug. 19, 2024

- **Evaluating Real-World Robot Manipulation Policies in Simulation**
  X. Li*, K. Hsu*, J. Gu*, K. Pertsch†, O. Mees†, H. Walke, C. Fu, I. Lunawat, I. Sieh, S. Kirmani, S. Levine, J. Wu, C. Finn, H. Su‡, Q. Vuong‡, T. Xiao‡
  Preprint
  Category: Robotics, Embodied AI
- **Open X-Embodiment: Robotic Learning Datasets and RT-X Models**
  Contributor and Author
  ICRA 2024 (Best paper)
  Category: Robotics, Embodied AI
- **PartSLIP++: Enhancing Low-Shot 3D Part Segmentation via Multi-View Instance Segmentation and Maximum Likelihood Estimation**
  Y. Zhou*, J. Gu*, **X. Li**, M. Liu, Y. Fang, H. Su
  Preprint
  Category: Vision-Language
- **Unleashing the Creative Mind: Language Model As Hierarchical Policy For Improved Exploration on Challenging Problem Solving**
  Z. Ling, Y. Fang, **X. Li**, T. Mu, M. Lee, R. Pourreza, R. Memisevic, H. Su
  Preprint
  Category: Language
- **OpenShape: Scaling Up 3D Shape Representation Towards Open-World Understanding**
  M. Liu*, R. Shi*, K. Kuang*, Y. Zhu, **X. Li**, S. Han, H. Cai, F. Porikli, H. Su
  NeurIPS 2023
  Category: Vision-Language
- **Deductive Verification of Chain-of-Thought Reasoning**
  Z. Ling*, Y. Fang*, **X. Li**, Z. Huang, M. Lee, R. Memisevic, H. Su
  NeurIPS 2023
  Category: Language

- **Situated Real-time Interaction with a Virtually Embodied Avatar**
  S. Panchal, G. Berger, A. Mercier, C. Bohm, F. Dietrichkeit, **X. Li**, R. Pourreza,
  P. Madan, A. Bhattacharyya, M. Lee, M. Todorovich, I. Bax, R. Memisevic — CVPR 2023 Embodied AI Workshop (Preprint)
  Category: Vision-Language, Embodied AI

- **Distilling Large Vision-Language Model with Out-of-Distribution Generalizability**
  X. Li*, Y. Fang*, M. Liu, Z. Ling, Z. Tu,, H. Su — ICCV 2023
  Category: Vision-Language, Embodied AI

- **Reparameterized Policy Learning for Multimodal Trajectory Optimization**
  Z. Huang, L. Liang, Z. Ling, **X. Li**, C. Gan, H. Su — ICML 2023 (Oral)
  Category: Robotics, Embodied AI

- **On the Efficacy of 3D Point Cloud Reinforcement Learning**
  Z. Ling*, Y. Yao*, **X. Li**, H. Su — Preprint
  Category: Vision, Embodied AI, Robotics

- **Frame Mining - A Free Lunch for Learning Robotic Manipulation from 3D Point Clouds**
  X. Li*, M. Liu*, Z. Ling*, Y. Li, H. Su — CoRL 2022
  Category: Vision, Embodied AI, Robotics

- **ManiSkill2: A Unified Benchmark for Generalizable Manipulation Skills**
  J Gu^{+}, F. Xiang^{+}, **X. Li***, Z. Ling*, X. Liu*, T. Mu*, Y. Tang*, S. Tao*, X. Wei*,
  Y. Yao*, X. Yuan, P. Xie, Z. Huang, R. Chen, H. Su — ICLR 2023
  Category: Vision, Embodied AI, Robotics

- **ManiSkill: Generalizable Manipulation Skill Benchmark with Large-Scale Demonstrations**
  T. Mu*, Z. Ling*, F. Xiang*, D. Yang*, **X. Li***, S. Tao, Z. Huang, Z. Jia, H. Su — NeurIPS 2021
  (Dataset & Benchmarks Track)
  Category: Vision, Embodied AI, Robotics

- **Improving Policy Optimization with Generalist-Specialist Learning**
  Z. Jia, **X. Li**, Z. Ling, S. Liu, Y. Wu, H. Su — ICML 2022
  Category: Robotics, Embodied AI

- **Discovering Non-Monotonic Autoregressive Orderings with Variational Inference**
  X. Li*, B. Trabucco*, D.H. Park, Y. Gao, M. Luo, S. Shen, T. Darrell — ICLR 2021
  Category: Vision-Language

- **Regularization Matters in Policy Optimization - An Empirical Study on Continuous Control**
  Z. Liu*, **X. Li***, B. Kang, T. Darrell — ICLR 2021 (Spotlight)
  Category: Robotics

Honors and Awards

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

Technical Skills

- **Languages**: Python, Java, C/C++, Bash, LaTeX, Golang, HTML/CSS
- **Libraries / Softwares**: PyTorch, Tensorflow, Numpy/Scipy/Pandas/Matplotlib/Scikit-learn, Jax, Open3D/Trimesh, 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

Service

- **Reviewer**:
  - Computer Vision: CVPR, ECCV, ICCV
  - Machine Learning: NeurIPS, ICML, ICLR
  - Robotics: ICRA, CoRL, RA-L, IJRR
- **Teaching Assistant**: Fall 2022 UCSD CSE 291 - ML for 3D Geometry