

# YEFAN ZHOU

yefan0726@berkeley.edu | yefanzhou.github.io ☞ | Berkeley, CA, 94709 | 510-809-5378

## EDUCATION

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| <b>Dartmouth College</b><br><i>Incoming Ph.D. student in Computer Science</i>  | Hanover, NH<br><i>Sep. 2023 –</i>            |
| <b>University of California, Berkeley</b><br><i>M.Eng in Electrical Engineering and Computer Science; Major GPA: 4.0/4.0</i><br>Coursework: Convex Optimization (A), Deep Reinforcement Learning (A+), Parallel Computing (A)<br>Principles and Techniques of Data Science (A) | Berkeley, CA<br><i>Aug. 2021 – Dec. 2022</i> |
| <b>University of California, Berkeley</b><br><i>Exchange Student; GPA: 4.0/4.0</i><br>Coursework: Data Structures (A+), Intro to Artificial Intelligence (A), Computational Structures in Data Science (A)<br>Robotic Manipulation and Interaction (A)                         | Berkeley, CA<br><i>Jan. 2019 – May. 2019</i> |
| <b>Southeast University</b><br><i>B.Eng in Information Engineering; GPA: 3.7/4</i><br>Coursework: Computer Architecture, Database System, Linux Operating System, Information Security<br>Principle of Communication, Analog Circuits, Electromagnetic Fields and Waves        | China<br><i>Aug. 2016 – Jun. 2020</i>        |

## PUBLICATION

- **Y. Zhou**, Y. Yang, A. Chang, M. W. Mahoney “A Three-regime model of Network Pruning” *2023 International Conference on Machine Learning (ICML 2023)* ☞
- **Y. Zhou**, Y. Shen, Y. Yan, C. Feng, Y. Yang “A Dataset-Dispersion Perspective on Reconstruction Versus Recognition in Single-View 3D Reconstruction Networks.” *2021 International Conference on 3D Vision (3DV 2021)* ☞
- X. Zhu, **Y. Zhou**, Y. Fan, J. Chen, M. Tomizuka “Learn to Grasp with Less Supervision: A Data-Efficient Maximum Likelihood Grasp Sampling Loss.” *2022 International Conference on Robotics and Automation (ICRA 2022)* ☞

## RESEARCH EXPERIENCE

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| <b>A Three-Regime model of Neural Network Pruning</b><br><i>Graduate Research Assistant, Advised by Prof. Michael Mahoney</i><br><ul style="list-style-type: none"><li>• Proposed a three-regime model based on the mode connectivity of the sparse models obtained from network pruning;</li><li>• Leveraged the three-regime model to predict the optimal early stopping in the pre-training stage of pruning pipeline.</li></ul>  | Berkeley, CA<br><i>Dec. 2021 –</i>           |
| <b>A Dataset-dispersion based Evaluation Metric on 3D Reconstruction</b> ☞<br><i>Research Assistant, Advised by Prof. Chen Feng, Prof. Yaoqing Yang</i><br><ul style="list-style-type: none"><li>• First author of a paper on single-view 3D reconstruction (SVR) in 3DV 2021;</li><li>• Proposed an evaluation metric <b>Dispersion Score</b>, a data-driven metric used to measure the tendency of SVR models to perform recognition or reconstruction;</li><li>• Dispersion Score is a formal approach to diagnose problems from the training data and guide the design of 3D data augmentation schemes.</li></ul>                  | Berkeley, CA<br><i>Dec. 2020 – Apr. 2021</i> |
| <b>Learn to Grasp with Less Supervision</b> ☞<br><i>Research Assistant, Mechanical Systems Control Lab, advised by Prof. Masayoshi Tomizuka</i><br><ul style="list-style-type: none"><li>• Co-authored a paper on supervised learning based robotic grasping in ICRA 2022;</li><li>• Proposed a maximum likelihood grasp sampling loss (<b>MLGSL</b>) and <b>attention-based</b> model architectures to predict grasps with a single-view depth image, focusing on tackling data label sparsity issue;</li><li>• MLGSL is 8× more data-efficient than SOTA with a <b>91.8%</b> grasp success rate in real-world experiments.</li></ul> | Berkeley, CA<br><i>Sep. 2020 – Dec. 2020</i> |
| <b>Robotics Exoskeleton and Humanoid Trajectory Planning</b> ☞<br><i>Research Assistant, Human-Assistive Robotic Tech Lab, advised by Prof. Ruzena Bajcsy</i><br><ul style="list-style-type: none"><li>• Developed trajectory planner and low-level controller for wearable robotic upper limb exoskeleton to assist patient’s arm movement in rehabilitation training;</li><li>• Applied Minimum Angle/Hand Jerk Algorithm to trajectory planner to realize Cartesian Space and Joint Space real-time humanoid trajectory planning and execution.</li></ul>   | Berkeley, CA<br><i>Jun. 2019 – Sep. 2019</i> |

## PROJECT EXPERIENCE

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### Hybrid Policy Gradient with Robotic Grasp Planning ↗

Berkeley, CA

*Deep RL Course Project, Co-advised by Prof. Sergey Levine*

*Sep. 2021 – Dec. 2021*

- Proposed Hybrid Policy Gradient (**H-PG**), a deep RL framework for predicting robotic grasping in warehouse;
- Proposed to define the RL problem in continuous-discrete action space, and solved it using deep policy gradient.
- H-PG improves baseline by **7.4%** of grasp success rate on YCB dataset in **PyBullet** simulator.

### Blink+: Increase GPU Communication Bandwidth using Idle Links across Tenants ↗

Berkeley, CA

*Parallel Computing Course Project, Co-advised by Prof. James Demmel*

*Feb. 2022 – May 2022*

- Optimized the NVIDIA GPU communication library **NCCL** for large-scale model parallel training;
- Increased the GPU tensor communication bandwidth by utilizing the idle NVLink across user groups;
- Improved the bandwidth of communication operators like broadcast and allreduce up to **200%** on 2 GPU subset.

### Robotic Tactile Sensor for Stiffness Estimation ↗

Berkeley, CA

*Robotic Manipulation Course Project, Co-advised by Prof. Ruzena Bajcsy*

*Feb. 2019 – May. 2019*

- Built a compliance-modulating tactile sensor using pneumatic sealed elastic membrane and a depth-sensing camera for scanning a 3D terrain and measuring the distribution of stiffness;
- Applied Point Cloud Library in C++, ROS and a RGBD camera to enable point cloud segmentation, geometry recognition, and Baxter robot arm control.
- Built a software to enable real-time 3D visualization of point cloud registration and integration including stiffness distribution information in mapping.

## SKILLS

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**Language:** Python, Java, C/C++, CUDA, SQL, MATLAB

**Learning:** Linear/Logistic Regression, Decision Tree, Random Forest, PCA, Clustering (K-means), Deep Models (Transformers, CNN), RL Algorithms (Q-Learning, Offline RL. etc), Model Compression (Pruning)

**Developer Tools:** PyTorch, Ubuntu, MuJoCo, ROS, PyBullet, Slurm, PyRender, Open3D