

# YULIN LIU

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<https://liuyulinn.github.io/>

## EDUCATION

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**Ph.D. of CSE**, University of California San Diego 2023.9-present

**Bachelor of Physics**, Peking University 2019.9 - 2023.7

- Grade Point Average: **3.85**/4.00 (Ranking Top 10%)

## RESEARCH EXPERIENCE

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### **TF-HOT: Training-Free Hand-Object Pose Tracking and Optimization for Dexterous Manipulation**

*Prof. Hao Su, UC, San Diego* 08/2024-present

- Build an efficient, training-free, in-the-wild hand-object tracking pipeline which takes only  $\sim 1$  minutes to covert a typically pick-up trajectory.
- Our method leverages differentiable rendering and rich priors from pre-trained 2D perception models to perform optimization of human hand and object pose trajectories.
- We demonstrated the state-of-the-art performance of our method over in-the-wild videos and illustrated an application of our method in imitation learning by incorporating a trajectory following reward.

### **Delving into Discrete Normalizing Flows on $SO(3)$ Manifold for Probabilistic Rotation Modeling**

*Prof. He Wang, Peking University* 07/2022-11/2022

- Proposed the **first** discrete normalizing flows on  $SO(3)$  manifold which have no singularity.
- The proposed normalizing flows consist of two modules, a Mobius-transformation-based coupling layer and a quaternion affine transformation.
- The proposed normalizing flows significantly outperform all baselines on fitting distribution on  $SO(3)$  and on predicting poses given input images, especially for symmetrical objects.

## INTERNSHIP

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### **VR Teleoperation System**

*Prof. Hao Su, Hillbot Inc.* 03/2024-08/2024

- Build a user-friendly VR teleportation system based on a simple design idea: "where your hand is where the robot".
- Support gripper, dexterous hand, single-arm, bi-manual robots, with 10+ robots out of the box.
- Simple API to create multiple and complex simulation environments and natively integrated into ManiSkill3.
- A unified interface for teleportation in both sim and real and can be easily set up for real robots.

## PUBLICATION

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- Stone Tao\*, Fanbo Xiang\*, Arth Shukla, Yuzhe Qin, Xander Hinrichsen, Xiaodi Yuan, Chen Bao, Xinsong Lin, **Yulin Liu**, Tse-kai Chan, Yuan Gao, Xuanlin Li, Tongzhou Mu, Nan Xiao, Arnav Gurha, Zhiao Huang, Roberto Calandra, Rui Chen, Shan Luo, Hao Su, *ManiSkill3: GPU Parallelized Robotics Simulation and Rendering for Generalizable Embodied AI* **Arxiv Preprint**
- Chao Xu, Ang Li, Linghao Chen, **Yulin Liu**, Ruoxi Shi, Hao Su, Minghua Liu, *SpaRP: Fast 3D Object Reconstruction and Pose Estimation from Sparse Views*, **ECCV 2024**

- Hansheng Chen, Ruoxi Shi, **Yulin Liu**, Bokui Shen, Jiayuan Gu, Gordon Wetzstein, Hao Su, Leonidas Guibas, *Generic 3D Diffusion Adapter Using Controlled Multi-View Editing*, **Arxiv Preprint**
- **Yulin Liu**<sup>\*</sup>, Haoran Liu<sup>\*</sup>, Yingda Yin<sup>\*</sup>, Yang Wang, Baoquan Chen, He Wang, *Delving into Discrete Normalizing Flows on  $SO(3)$  Manifold for Probabilistic Rotation Modeling*, **CVPR 2023**

## HORNORS & REWARDS

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- National Scholarship (Top 1%), *Ministry of Education in China*
- Merit Students (Every year), *Peking University*
- Wu-Si Scholarship, highest scholarship in *Peking University*
- First-Class Scholarship, *Peking University*
- 1st Prize in Chinese Physics Olympiad, ranking 3rd among girls, *China*

## SKILLS

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- Programming and Software Python, C++
- AI Framework Pytorch
- Background 3D Vision, RL