Jiachen Tao

+1-312-451-5303 | jtao26@uic.edu | Homepage
Google Scholar | LinkedIn | GitHub

Available for internship: May 2027 – Aug 2027

Research Summary

Ph.D. student studying how robot policies retain and compose skills and improve from their own experience. My first-author work spans vision-language-action policy adaptation (PRISM, NeurIPS 2026) and policy self-improvement (CoachSI). My earlier work on 3D and 4D perception includes ReflFlow (ICML 2026) and X-Field (NeurIPS 2025 Spotlight, co-first author).

Education

- **University of Illinois Chicago** — *Aug. 2024 – May 2029 (Expected)*, Chicago, IL
  Ph.D. Student in Computer Science, Advisor: Prof. Yan Yan
- **Zhejiang University** — *Aug. 2018 – Jul. 2022*, Hangzhou, China
  B.Eng. in Computer Science and Technology, Advisor: Prof. Yi Yang

Peer-Reviewed Publications

Full list of publications at **Google Scholar**. * Equal contribution.

[C.1] **Jiachen Tao**, Gengyu Zhang, Haoxuan Wang, Bing Liu, Yan Yan. **PRISM: Primitive Routing via In-context Skill Mixing for Retentive VLA Adaptation**. NeurIPS 2026.
Developed a parameter-efficient VLA adaptation framework for continual learning, retaining learned robot skills while composing them for long-horizon manipulation. Combines frozen LoRA skill primitives with vision-language-conditioned routing in a flow-matching action policy; evaluated on RoboCasa365 and on an AgileX PIPER arm using demonstrations collected via leader-follower teleoperation.

[C.2] **Jiachen Tao**, Junyi Wu, Haoxuan Wang, Zongxin Yang, Dawen Cai, Yan Yan. **ReflFlow: Learning Geometry-Guided Ray Tracing for Dynamic Specular Reconstruction**. ICML 2026.

[C.3] Feiran Wang*, **Jiachen Tao***, Junyi Wu*, Haoxuan Wang, Bin Duan, Kai Wang, Zongxin Yang, Yan Yan. **X-Field: A Physically Informed Representation for 3D X-ray Reconstruction**. NeurIPS 2025 **Spotlight**.

[C.4] Junyi Wu, Van Nguyen Nguyen, Benjamin Planche, **Jiachen Tao**, Changchang Sun, Zhongpai Gao, Zhenghao Zhao, Anwesa Choudhuri, Gengyu Zhang, Meng Zheng, Feiran Wang, Terrence Chen, Yan Yan, Ziyan Wu. **Consistent Instance Field for Dynamic Scene Understanding**. CVPR 2026.

[C.5] Junyi Wu, **Jiachen Tao**, Haoxuan Wang, Gaowen Liu, Ramana Rao Kompella, Yan Yan. **Orientation-anchored Hyper-Gaussian for 4D Reconstruction from Casual Videos**. NeurIPS 2025.

[C.6] Nikhil Sharma, **Jiachen Tao**, Junyi Wu, Yan Yan. **DepthHMR: Leveraging Depth Around Humans for Multi-Human Mesh Generation**. BMVC 2025.

Preprints and Manuscripts

[M.1] **Jiachen Tao**, Gengyu Zhang, Haoxuan Wang, Bing Liu, Yan Yan. **CoachSI: Self-Improvement of Robot Policies with a Language Coach**. arXiv preprint, 2026.
Developed CoachSI, a method for training robot policies from successful trials guided by a language coach. With the coach choosing the next step from camera images during data collection, OpenWAM's unassisted success rate rose from 47.4% to 56.8% on 18 long-horizon RoboCasa365 tasks in unseen scenes.

[M.2] Minghao Guo, Meng Cao, **Jiachen Tao**, Rongtao Xu, Yan Yan, Xiaodan Liang, Ivan Laptev, Xiaojun Chang. **GLaD: Geometric Latent Distillation for Vision-Language-Action Models**. arXiv preprint, 2025.
Implemented the model for a geometry-aware VLA that distills frozen VGGT features into multimodal Transformer representations during continued pre-training, followed by LoRA-based post-training for robot manipulation.

[M.3] **Jiachen Tao**, Benjamin Planche, Van Nguyen Nguyen, Junyi Wu, Yuchun Liu, Haoxuan Wang, Zhongpai Gao, Gengyu Zhang, Feiran Wang, Anwesa Choudhuri, Zhenghao Zhao, Weitai Kang, Terrence Chen, Yan Yan, Ziyan Wu. **From Particles to Fields: Reframing Photon Mapping with Continuous Gaussian Photon Fields**. Under Review. 2026.

[M.4] Yusen Peng, Haoxuan Wang, **Jiachen Tao**, Yasutomo Kawanishi, Yan Yan. **SVD^3: Singular Value Decomposition for Visual Geometry Model Compression**. Under Review. 2026.

[M.5] Haoxuan Wang, **Jiachen Tao**, Junyi Wu, Gaowen Liu, Ramana Rao Kompella, Yan Yan. **Motion Marionette: Rethinking Rigid Motion Transfer via Prior Guidance**. arXiv preprint, 2025.

[M.6] Mingwei Li, **Jiachen Tao**, Zongxin Yang, Yi Yang. **Human101: Training 100+FPS Human Gaussians in 100s from 1 View**. arXiv preprint, 2023.

[M.7] **Jiachen Tao**, Mingwei Li, Zongxin Yang, Yi Yang. **MARVEL: Multi-scale Transformer-based Rendering with Voxel-based Efficient Learning for Avatars**. Manuscript, 2022.

Work Experience

Mitsubishi Electric Research Laboratories (MERL) *Cambridge, MA*
Research Intern May 2026 – Aug. 2026

Developed a physics-based 3D reconstruction method that recovers invisible airflow from background distortions observed in extremely sparse views by combining adaptive 3D Gaussians with PDE constraints. Derived and implemented an analytic, CUDA-accelerated light-bending model, closely matching numerical ray-tracing accuracy while rendering 573× faster. (paper in submission)

United Imaging Intelligence *Boston, MA*
Research Intern May 2025 – Aug. 2025

Developed Gaussian Photon Field, a physics-grounded representation that converts photon simulations into a reusable continuous field for novel-view rendering. Reduced rendering from hours to seconds while retaining high-fidelity caustics and indirect illumination.

Zhejiang University *Hangzhou, China*
Research Assistant Jul. 2022 – Jun. 2024

Developed MARVEL, a transformer-based 3D-aware GAN for pose-controllable avatar generation from random latent codes. Also developed efficient monocular-video human reconstruction with Human101, reconstructing a dynamic Gaussian avatar in 100 seconds and rendering at over 100 FPS.

Baidu Research *Beijing, China*
Research Intern Jan. 2022 – Jun. 2022

Developed person and vehicle re-identification models for identity matching across camera views.

Skills

- **Programming & Frameworks:** Python, C++, CUDA, PyTorch
- **Robot Learning:** Vision-language-action models, behavior cloning, skill retention and composition, simulation benchmarking (RoboCasa365)
- **Real-Robot Systems:** Leader-follower teleoperation for demonstration collection, closed-loop VLA policy deployment on AgileX PIPER
- **Model Adaptation:** Multimodal transformers, flow matching, LoRA fine-tuning, geometric distillation, pre-training and post-training
- **3D & Scene Representations:** 3D/4D Gaussian representations, monocular reconstruction, differentiable rendering, ray tracing

Academic Service

Conference Reviewer: ICLR 2025–2026, NeurIPS 2025–2026, CVPR 2026, ICML 2026, ECCV 2026

Mentoring Experience

- **Nikhil Sharma (Ph.D. Student, Illinois Institute of Technology)** *Jan. 2025 – May 2025*
  Research Mentor; project resulted in his first-author paper at BMVC 2025 [C.6]