

YIBO LIU

buaayorklau@gmail.com

Personal Webpage | Google Scholar

<https://github.com/York-SDCNLab> | LinkedIn

RESEARCH INTEREST

My research interest lies in the domain of computer vision and generative AI.

- I began pursuing a Ph.D. degree in January 2020 with a focus on robotic vision, and during that time, my research centered on the localization and navigation of robots ([RA-L2022](#), [IROS2022](#), [RA-L2024](#)).
- Since 2022, my research primarily involved in-the-wild object 3D reconstruction and 3D content (NeRFs/3D Gaussians Splatting) generation, which provides objects for the simulation in autonomous driving. I had one first-author paper, [MV-DeepSDF](#), accepted to [ICCV2023](#). Moreover, I was the Top-3 winner of OmniObject3D challenge at ICCV2023 [report] .
- Since mid-2023, I have been conducting research on LLM, Vision Question Answering (VQA), and Diffusion Models intending to generate photorealistic 2D/3D assets. I had one first-author paper, [VQA-Diff](#), accepted to [ECCV2024](#).

RESEARCH EXPERIENCE

Noah's Ark Lab, Huawei Canada

Feb 2022 - present

Part-time Research Intern. Mentor: Yuan Ren

Toronto, Canada

- Focused on in-the-wild object reconstruction and image/text-to-3D content generation under the background of simulation in the autonomous driving industry. My research involved Visual Question Answering models, Diffusion models, NeRFs, and Gaussian Splatting.
- Contribution:
MV-DeepSDF: Implicit Modeling with Multi-Sweep Point Clouds for 3D Vehicle Reconstruction in Autonomous Driving (**first author**, [ICCV2023](#), [DOI](#)).
Top-3 winner of OmniObject3D challenge (Co-first author, [ArXiv](#), [ICCV2023 AI for 3D Content Creation Workshop](#)).
VQA-Diff: Exploiting VQA and Diffusion for Zero-Shot Image-to-3D Vehicle Asset Generation in Autonomous Driving (**first author**, [ECCV2024](#)).

York University

Jan 2020 – present

Research Assistant. Supervisor: Prof. Jinjun Shan.

Toronto, Canada

- Focused on robotic vision which involved camera/LiDAR-based perception, SLAM, and navigation.
- Contribution:
Intensity Image-based LiDAR Fiducial Marker System (first author, [RA-L2022](#), [DOI](#), Github **55** stars) .
Application of Ghost-DeblurGAN to Fiducial Marker Detection (first author, [IROS2022](#), [DOI](#), Github **31** stars).
Mapping and Localization using LiDAR Fiducial Markers (first author, submitted to [RA-L](#), Github **110** stars).

EDUCATION

York University, Lassonde School of Engineering

Toronto, Canada

Ph.D. Student. Supervisor: Prof. Jinjun Shan.

Jan 2020-present

- Scholarship:
Academic Excellence Fund (maximum amount, 2022, 2023).
York Graduate Scholarship (2020).

BeiHang University, School of Aeronautic Science and Engineering

Beijing, China

Master

Sep 2017-Jan 2020

- Scholarship:
First-class Academic Merit (Top 3%).
Outstanding Science and Technology Competition Medal of May 4th (5 out of 22,000).
Ministry of Industry and Information Technology Innovation and Entrepreneurship (10 out of 40,000)

- Scholarship:
Outstanding Graduate (Top 5%);
Outstanding Student Cadres

SELECTED PUBLICATION & AWARD LIST

Publication

- [1]**Liu Y**, Yang Z, Wu G, Ren Y, Lin K, Liu B, Liu Y, Shan J. "VQA-Diff: Exploiting VQA and Diffusion for Zero-Shot Image-to-3D Vehicle Asset Generation in Autonomous Driving", in Proc. European Conference on Computer Vision (**ECCV**), 2024.
- [2]**Liu Y**, Zhu K, Wu G, Ren Y, Liu B, Liu Y, Shan J. "MV-DeepSDF: Implicit Modeling with Multi-Sweep Point Clouds for 3D Vehicle Reconstruction in Autonomous Driving", in Proc. IEEE/CVF International Conference on Computer Vision (**ICCV**), 2023, pp. 8306-8316.
- [3]Yang Z, **Liu Y**, Wu G, Cao T, Ren Y, Liu Y, Liu B. "Learning Effective NeRFs and SDFs Representations with 3D Generative Adversarial Networks for 3D Object Generation". Top-3 winner of **ICCV 2023** OmniObject3D Challenge (3D content generation task).
- [4]**Liu Y**, Schofield H, Shan J. "Intensity Image-Based LiDAR Fiducial Marker System", in IEEE Robotics and Automation Letters (**RA-L**), vol. 7, no. 3, pp. 6542-6549, July 2022, doi: 10.1109/LRA.2022.3174971.
- [5]**Liu Y**, Schofield H, Shan J. "Application of Ghost-DeblurGAN to Fiducial Marker Detection", in Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), 2022, pp. 6827-6832, doi: 10.1109/IROS47612.2022.9981701.
- [6]**Liu Y**, Schofield H, Shan J. "Navigation of a Self-Driving Vehicle Using One Fiducial Marker", in Proc. IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems (MFI), 2021, pp. 1-6, doi: 10.1109/MFI52462.2021.9591194.
- [7]Zhang S, Shan J and **Liu Y**. "Variational Bayesian Estimator for Mobile Robot Localization With Unknown Noise Covariance," in IEEE/ASME Transactions on Mechatronics, vol. 27, no. 4, pp. 2185-2193, Aug. 2022, doi: 10.1109/T-MECH.2022.3161591.

Award

- [1]**Top-3 winner** of OmniObject3D Challenge at **ICCV2023** (3D Object Generation Task).
- [2]The first prize, 15th 'Challenge Cup' National Science and Technology College of extra-curricular academic competition works, second author
- [3]Excellent Grade, 9th National College Students Innovation and Entrepreneurship Training Plan, initiator

TECHNICAL REVIEWER

- Annual Conference on Neural Information Processing Systems (**NeurIPS**)
- IEEE Robotics and Automation Letters (**RA-L**), IEEE Robotics and Automation Magazine (**RA-M**)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), IEEE/ASME International Conference on Advanced Intelligent Mechatronics (**AIM**)
- IEEE Transactions on Instrumentation and Measurement (**TIM**)
- IEEE Transactions on Industrial Electronics (**TIE**)