Yuliang Guo

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RESEARCH INTERESTS

Computer Vision, 3D Vision, Embodied AI

EDUCATION

Brown University
Ph.D. in Computer Science, Advised by Benjamin Kimia, Thomas Serre 2012-2018
M.S. in Computer Engineering, Advised by Benjamin Kimia 2009-2011

Shanghai Jiao Tong University
B.S. in Material Science 2005-2009

INDUSTRIAL EXPERIENCE

Bosch Research, Sunnyvale, CA
Lead Research Scientist (Tech Lead), Managed by Liu Ren 2024-Now
Senior Research Scientist (Tech Lead), 2021-2023

- Universal representation for cross-camera, cross-embodiment perception and AI
- Interactable 3D world reconstruction for robot navigation and manipulation
- Active vision and spatial computing for augmented reality (AR) in industrial assembly assistance
- Precision 3D perception for advanced vehicle parking assistance

OPPO Research, Palo Alto, CA
Senior Research Scientist, Managed by Yi Xu 2019-2020

- Real-time human posture estimation for avatar motion control
- 3D perception and reconstruction for AR devices

Baidu USA, Sunnyvale, CA
Senior Research Engineer, Managed by Tae Eun Choi 2018-2019

- 3D perception system for Apollo autonomous driving platform

SELECTED PUBLICATIONS

† Project Lead

1. "SUP-NeRF: A Streamlined Unification of Pose Estimation and NeRF Resolving Scale-Depth Ambiguity in Monocular Object Reconstruction", **Yuliang Guo**†, Abhinav Kumar, Cheng Zhao, Ruoyu Wang, Xinyu Huang, Liu Ren, ECCV 2024
2. "TCLC-GS: Tightly Coupled LiDAR-Camera Gaussian Splatting for Surrounding Autonomous Driving Scenes", Cheng Zhao, Su Sun, Ruoyu Wang, **Yuliang Guo**, Junjun Wan, Zhou Huang, Xinyu Huang, Victor Chen, Liu Ren, ECCV 2024

3. “SeaBird: Segmentation in Bird’s View with Dice Loss Improves Monocular 3D Detection of Large Objects”, Abhinav Kumar†, **Yuliang Guo**†, Xinyu Huang, Liu Ren, Xiaoming Liu, CVPR 2024
4. “Enhancing Online Road Network Perception and Reasoning with Standard Definition Maps”, Hengyuan Zhang, David Paz, **Yuliang Guo**, Arun Das, Xinyu Huang, Haug Karsten, Henrik Iskov Christensen, Liu Ren, IROS 2024
5. “Behind the Veil: Enhanced Indoor 3D Scene Reconstruction with Occluded Surfaces Completion”, Su Sun, Cheng Zhao†, **Yuliang Guo**†, Ruoyu Wang, Xinyu Huang, Victor Chen, Liu Ren, CVPR 2024
6. “3D Copy-Paste: Physically-Plausible Object Insertion for Monocular 3D Detection”, Yuhao Ge, Hong-Xing Yu, Cheng Zhao, **Yuliang Guo**, Xinyu Huang, Liu Ren, Laurent Itti, Jiajun Wu, NeurIPS 2023
7. “Symmetry and Uncertainty-Aware Object SLAM for 6DoF Object Pose Estimation”, Nathaniel Merrill†, **Yuliang Guo**†, Xingxing Zuo, Xinyu Huang, Stefan Leutenegger, Xi Peng, Liu Ren, Guoquan Huang, CVPR, 2022
8. “OmniFusion: 360 Monocular Depth Estimation via Geometry-Aware Fusion”, Yuyan Li, **Yuliang Guo**†, Zhixin Yan, Xinyu Huang, Ye Duan, Liu Ren, CVPR (**Oral Presentation**) 2022
9. “PoP-Net: Pose over Parts Network for Multi-Person 3D Pose Estimation from a Depth Image”, **Yuliang Guo**†**,** Zhong Li, Zekun Li, Xiangyu Du, Shuxue Quan, Yi Xu, WACV 2022
10. “Gen-LaneNet: a generalized and scalable approach for 3D lane detection”, **Yuliang Guo**†, Guang Chen, Peitao Zhao, Weide Zhang, Jinghao Miao, Jingao Wang, Tae Eun Choe, ECCV 2020
11. “Robust pose tracking with a joint model of appearance and shape”, **Yuliang Guo**†, Lakshmi N. Govindarajan, Benjamin B. Kimia, Thomas Serre, arXiv, 2018
12. “Differential Geometry in Edge Detection: accurate estimation of position, orientation and curvature”, Benjamin B. Kimia, Xiaoyan Li, **Yuliang Guo**, Amir Tamrakar, TPAMI 2018
13. “A systematic comparison between visual cues for boundary detection”, David A. Mely, Junkyung Kim, Mason McGill, **Yuliang Guo**, Thomas Serre, Vision Research 2016
14. "A Multi-stage Approach to Curve Extraction", **Yuliang Guo**†, Naman Kumar, Maruthi Narayanan, Benjamin B Kimia, ECCV 2014

IN SUBMISSION

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1. “HybridOCC: Hybrid-resolution Semantic Occupancy Perception via Object-centric Surface Reconstruction”, Chao Chen, Ruoyu Wang, Cheng Zhao, **Yuliang Guo**, Xinyu Huang, Chen Feng, Liu Ren, NeurIPS 2024

WORKING PAPERS

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1. “MeDAC: Metric Depth from Any Camera”, **Yuliang Guo**†, Mahdi Miangoleh, Xinyu Huang, Yağız Aksoy, Liu Ren
2. “Projective Equivariant Convolution Generalizing Monocular 3D Perception to Novel Rigs”, Abhinav Kumar†, **Yuliang Guo**†, Ruoyu Wang, Cheng Zhao, Xinyu Huang, Liu Ren, Xiaoming Liu

TECHNICAL SKILLS

Programming: python, C/C++, Matlab

Applications/library platform: Pytorch, OpenCV, Tenterflow