Yuliang Guo

Redwood City, CA, USA
Tel: 401-573-0093 | Email: 33yuliangguo@gmail.com | Personal Website | Google Scholar

RESEARCH INTERESTS

Monocular 3D Vision, 3D Reconstruction, 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, Managed by Liu Ren — 2024-Now
- Senior Research Scientist, — 2021-2023

- Foundational 3D perception generalizable to different cameras and embodiments
- Semantic reconstruction and mapping for robot navigation and manipulation
- Augmented reality (AR) in production line assistance
- Precision camera perception for 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 on AR devices

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

- Perception system for Apollo autonomous driving platform

SELECTED PUBLICATIONS

† Project Lead

1. "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
2. "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
3. "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

4. “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
5. “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
6. “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
7. “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
8. “Robust pose tracking with a joint model of appearance and shape”, **Yuliang Guo**†, Lakshmi N. Govindarajan, Benjamin B. Kimia, Thomas Serre, arXiv, 2018
9. “Differential Geometry in Edge Detection: accurate estimation of position, orientation and curvature”, Benjamin B. Kimia, Xiaoyan Li, **Yuliang Guo**, Amir Tamrakar, TPAMI, 2018
10. “A systematic comparison between visual cues for boundary detection”, David A. Mely, Junkyung Kim, Mason McGill, **Yuliang Guo**, Thomas Serre, Vision Research, 2016
11. "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. “MeDAC: Metric Depth from Any Camera”, **Yuliang Guo**†, Mahdi Miangoleh, Xinyu Huang, Yağız Aksoy, Liu Ren, NeurIPS 2024
2. “LieConv: Lie Convolutions for Viewpoint Robustness in Monocular 3D Perception”, Abhinav Kumar, **Yuliang Guo**†, Ruoyu Wang, Cheng Zhao, Xinyu Huang, Liu Ren, Xiaoming Liu, NeurIPS 2024
3. “Finetuning LLM for Visual Navigation via 3D Scene Graphs”, Jiading Fang, **Yuliang Guo**†, Christian Juette, Xinyu Huang, Liu Ren, NeurIPS 2024
4. “UPNeRF: A Unified Framework for Monocular 3D Object Reconstruction and Pose Estimation”, **Yuliang Guo**†, Abhinav Kumar, Cheng Zhao, Ruoyu Wang, Xinyu Huang, Liu Ren, ECCV 2024
5. “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, ECCV 2024
6. “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

TECHNICAL SKILLS

Programming: python, C/C++, Matlab
Applications/library platform: Pytorch, OpenCV, Tenterflow