

# Yuliang Guo

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## RESEARCH INTERESTS

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Computer Vision, 3D Vision, Embodied AI

## EDUCATION

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### 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

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### 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

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<sup>†</sup> Project Lead

1. “SeaBird: Segmentation in Bird’s View with Dice Loss Improves Monocular 3D Detection of Large Objects”, Abhinav Kumar<sup>†</sup>, **Yuliang Guo**<sup>†</sup>, 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<sup>†</sup>, **Yuliang Guo**<sup>†</sup>, 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<sup>†</sup>, **Yuliang Guo<sup>†</sup>**, 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<sup>†</sup>**, 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<sup>†</sup>**, 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<sup>†</sup>**, 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<sup>†</sup>**, 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<sup>†</sup>**, Naman Kumar, Maruthi Narayanan, Benjamin B Kimia, ECCV 2014

## IN SUBMISSION

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1. “UPNeRF: A Unified Framework for Monocular 3D Object Reconstruction and Pose Estimation”, **Yuliang Guo<sup>†</sup>**, Abhinav Kumar, Cheng Zhao, Ruoyu Wang, Xinyu Huang, Liu Ren, ECCV 2024
  2. “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
  3. “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
  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

## WORKING PAPERS

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

## TECHNICAL SKILLS

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Programming: python, C/C++, Matlab

Applications/library platform: Pytorch, OpenCV, Tenterflow