Lv, Zhaoyang

Email: zhaoyang@meta.com, lvzhaoyang1990@gmail.com
Personal Website: `lvzhaoyang.github.io`
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Current Work

Staff Research Scientist Surreal team, Reality Labs Research — July 2022 - Present
Meta — Santa Clara, U.S.
Featured work:
1. Started the Digital Twin Catalog (DTC) team. In ECCV 2024, we released the ultra high quality 3D object datasets, and I co-developed a few state-of-the-art methods for photoreal reconstruction.
2. Built various prototype systems and demos for novel contextual AI experiences that connect multimodal sensing from our Project Aria platform.

Senior Research Scientist Surreal team, Reality Lab Research — Jan. 2021 - July 2022
Meta — Redmond, U.S.
Featured work:
1. Initiated and co-led the efforts for CVPR 2022 Project Aria tutorial and first time brought Project Aria device to public.
2. Co-founded the personal timeline research workstream and made a few early stage researchs and demo in contextual AI.

Research Scientist Surreal team, Reality Lab Research — Sept. 2019 - Jan. 2021
Meta — Redmond, U.S.
Featured work: Led the project Neural 3D Video Synthesis, for photorealistic general-purpose 3D video. The public version of the work was presented in CVPR 2022 as an oral presentation.

Education

Ph.D. in Robotics RIM center, School of Interactive Computing — Aug.2014 - Aug.2019
Georgia Institute of Technology — Atlanta, U.S.
- Phd Thesis: *Visual Dense Three-Dimensional Motion Estimation in the Wild*
- Advisor: James Rehg, Frank Dellaert (co-advised)
- Qualifer exam areas: Perception, AI and Control.

M.Sc. Artificial Intelligence in Computing — Sept.2012 - Sept.2013
The Imperial College of Science, Technology and Medicine — London, U.K.
- Master Thesis: *KinfuSeg: A Dynamic SLAM Approach Based on KinectFusion*.
- Courses: Distinction (Highest level awarded top 15%)
- Awards: Distinguished Thesis (3 among 71), Top 5%.

B.Sc. Electrical Engineering in Aeronautics — Sept.2008 - July 2012
Northwestern Polytechnical University (CN) — Xi'an, P.R.China
- Courses: 89.5, Top 5%;
- Bachelor Thesis: *Quadrotor Design and its Navigation*, 90.0, Top 5%

Selected Publications

4DGT: Learning a 4D Gaussian Transformer Using Real-World Monocular Videos,
Zhen Xu et al. **Zhaoyang Lv** (senior author)
Arxiv, 2025, arXiv:2506.08015

Photoreal Scene Reconstruction from an Egocentric Device,
Zhaoyang Lv et al.

ACM SIGGRAPH 2025, arXiv:2506.04444

Monocular Online Reconstruction with Enhanced Detail Preservation,
Songyin Wu et al. **Zhaoyang Lv** (second author)
ACM SIGGRAPH 2025, arXiv:2505.07887

Large Inverse Rendering Model for Progressive Reconstruction of Shape, Materials and View-dependent Radiance Fields,
Zhengqin Li et al. **Zhaoyang Lv** (core team),
Computer Vision and Pattern Recognition (CVPR) 2025, arXiv:2504.20026

Digital Twin Catalog: A Large-Scale Photorealistic 3D Object Digital Twin Dataset,
Zhao Dong et al. **Zhaoyang Lv** (core team)
Computer Vision and Pattern Recognition (CVPR) 2025, arXiv:2504.08541

EgoLifter: Open-world 3D Segmentation for Egocentric Perception,
Qiao Gu et al. **Zhaoyang Lv** (second author)
European Conference on Computer Vision (ECCV) 2024

VideoLLM-online: Online Large Language Model for Streaming Video,
Joya Chen et al. **Zhaoyang Lv** (second author)
Computer Vision and Pattern Recognition (CVPR) 2024

Aria Everyday Activities Dataset,
Zhaoyang Lv, et al.
Technical Report, 2024
Project lead for the first open sourced Project Aria dataset.

Neural 3D Video Synthesis from Multi-view Video,
Tianye Li et al. **Zhaoyang Lv** (senior author and project lead)
Computer Vision and Pattern Recognition (CVPR) 2022, Oral Presentation (∼5%)

STaR: Self-supervised Tracking and Reconstruction of Rigid Objects in Motion with Neural Rendering,
Wentao Yuan et al **Zhaoyang Lv** (second author)
Computer Vision and Pattern Recognition (CVPR) 2021

Taking a Deeper Look at the Inverse Compositional Algorithm,
Zhaoyang Lv et al.
Computer Vision and Pattern Recognition (CVPR) 2019, Oral Presentation (∼5%), Best Paper Finalist (<1%))

Learning Rigidity in Dynamic Scenes with a Moving Camera for 3D Motion Field Estimation,
Zhaoyang Lv et al.
European Conference on Computer Vision (ECCV) 2018

Multi-class Classification without Multi-class Labels,
Yen-Chang Hsu et al. **Zhaoyang Lv** (second author)
International Conference on Learning Representations (ICLR) 2019

Learning to Cluster in Order to Transfer across Domains and Tasks ,
Yen-Chang Hsu, **Zhaoyang Lv**, Zsolt Kira,
International Conference on Learning Representations (ICLR) 2018

A Continuous Optimization Approach for Efficient and Accurate Scene Flow,
Zhaoyang Lv et al.
European Conference on Computer Vision (ECCV) 2016

Patents

Learning rigidity of dynamic scenes for three-dimensional scene flow estimation,
Zhaoyang Lv, Kihwan Kim, Deqing Sun, Alejandro Jose Troccoli, Jan Kautz,
US Patent App. 16/052.528

Motion Planning and Intention Prediction for Autonomous Driving in Highway Scenarios via Graphical Model-based Factorization,
Zhaoyang Lv, Aliakbar Aghamohammadi, Amir Tamjidi,
US Patent App. 15/601.047

Holistic Planning with Multiple Intentions for Self-driving Cars,
Zhaoyang Lv, Aliakbar Aghamohammadi,
US Patent App. 15/604,437

Prior Experience

Research Intern Learning and Perception Research Group — Jan. 2019 - May 2019
Nvidia Research — Santa Clara, U.S.
Director: Jan Kautz
Mentors: Kihwan Kim, Deqing Sun, Alejandro Troccoli

PhD Intern Autonomous Vision Group — June 2018 - Nov. 2018
Max Planck Institute Intelligent System — Tuebingen, Germany
Advisor: Andreas Geiger

Research Intern Learning and Perception Research Group — May 2017 - Aug 2017
Nvidia Research — Santa Clara, U.S.
Director: Jan Kautz;
Mentors: Kihwan Kim, Deqing Sun, Alejandro Troccoli

Research Inten Autonomous Vehicle Sensor Fusion — May 2016 - Aug. 2016
Qualcomm R&D — San Diego, U.S.
Manager: Ali-akbar Agha-mohammadi (Ali Agha)

Research Intern Computer Vision Group — Dec.2013 - July 2014
State Key Lab of CAD&CG, Zhejiang University — Hangzhou, P.R. China
Advisor: Guofeng Zhang

Misc

Co-organizer *CVPR 2025 Workshop: 3D Digital Twin* — June 2025
Project lead *CVPR 2022 Tutorial: Towards always-on egocentric vision research using Meta's Aria glasses* — June 2022
Teaching Instructor *Georgia Tech Computer Vision 4476 Course* — Summer 2019
Teaching Assistant *Georgia Tech Deep Learning 7643* — Fall 2017
Teaching Assistant *Georgia Tech Computer Vision 4476/6476* — Fall 2016
Vice President in Public Relation of Georgia Tech *RoboGrads* — Fall 2016 - May 2017
Journal Reviewer for T-PAMI, IJCV, T-Multimedia
Conference Reviewer for CVPR, ECCV, ICCV, SIGGRAPH, SIGGRAPH Asia, ICLR, AAAI, IROS, ICRA

Software (Primary)

Programming Languages: C++, Python
Deep Learning: Pytorch