Lv, Zhaoyang

Email: zhaoyang@meta.com, lvzhaoyang1990@gmail.com
Personal Website: `lvzhaoyang.github.io`
Last update: 06/07/2023

Current Work

Staff Research Scientist Surreal team, Reality Labs Research — July 2022 - Present
Meta — Santa Clara, U.S.
Research areas: multimodal understanding and learning, multimodal instruction tuning, chain of reasoning with LLM
Featured Work: I build various prototype systems for novel contextual AI experiences that connect multimodal sensing from our Project Aria platform to LLM.

Senior Research Scientist Surreal team, Reality Lab Research — Jan. 2021 - July 2022
Meta — Redmond, U.S.
Research areas: dynamic 4D reconstruction and understanding, egocentric multimodal understanding
Featured work: I initiated and co-lead the efforts for CVPR 2022 Project Aria tutorial, and release the first public dataset and open-source tool for Project Aria device. I also work on cutting-edge research and build system for neural reconstruction, mutlimodal computer vision experience, with primary focus on our egocentric platform Project Aria device. The public reference for some of my work with the team are recorded in tutorial videos

Research Scientist Surreal team, Reality Lab Research — Sept. 2019 - Jan. 2021
Meta — Redmond, U.S.
Research areas: 3D video, neural reconstruction & rendering, differentiable rendering, computational photography
Featured work: Neural 3D Video Synthesis. I led the work using machine learning for the future experience of photorealistic telepresence as general-purpose 3D video. I led the efforts in building the device prototype, collecting the multiview dataset, and a novel neural rendering method using neural radiance fields representation for dynamic scenes. The public version of the work is 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

AdaNeRF: Adaptive Sampling for Real-time Rendering of Neural Radiance Fields,
Andreas Kurz, Thomas Neff, **Zhaoyang Lv**, Michael Zollhöfer, Markus Steinberger

European Conference on Computer Vision (ECCV) 2022

Neural 3D Video Synthesis from Multi-view Video,
Tianye Li, Mira Slavcheva, Michael Zollhoefer, Simon Green, Christoph Lassner, Changil Kim, Tanner Schmidt, Steven Lovegrove, Michael Goesele, Richard Newcombe, **Zhaoyang Lv**
Computer Vision and Pattern Recognition (CVPR) 2022, Oral Presentation (∼5%)
Project lead

STaR: Self-supervised Tracking and Reconstruction of Rigid Objects in Motion with Neural Rendering,
Wentao Yuan, **Zhaoyang Lv**, Tanner Schmidt, Steven Lovegrove Computer Vision and Pattern Recognition (CVPR) 2021

SENSE: A Shared Encoder Network for Scene-flow Estimation,
Huaizu Jiang, Deqing Sun, Varun Jampani, **Zhaoyang Lv**, Erik Learned-Miller, Jan Kautz,
International Conference on Computer Vision (CVPR) 2019, Oral Presentation (∼5%)

Taking a Deeper Look at the Inverse Compositional Algorithm,
Zhaoyang Lv, Frank Dellaert, James M. Rehg, Andreas Geiger,
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, Kihwan Kim, Alejandro Troccoli, Deqing Sun, James M. Rehg, Jan Kautz,
European Conference on Computer Vision (ECCV) 2018

Multi-class Classification without Multi-class Labels,
Yen-Chang Hsu, **Zhaoyang Lv**, Joel Schlosser, Phillip Odom, Zsolt Kira,
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, Chris Beall, Pablo F. Alcantarilla, Fuxin Li, Zsolt Kira, Frank Dellaert,
European Conference on Computer Vision (ECCV) 2016

Patents

Neural 3D Video Synthesis,
Zhaoyang Lv, Miroslava Slavcheva, Tianye Li, Michael Zollhoefer, Simon Gareth Green, Tanner Schmidt, Michael Goesele, Steven John Lovegrove, Christoph Lassner, Changil Kim
US Patent App. 17/571,285

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

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
Organizer Georgia Tech *Computer Vision Reading Group* — Fall 2015 - Fall 2018
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, AAAI, IROS, ICRA

Software (Primary)

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