

Zhixiang Min

Email: noah.zx.min@gmail.com | HP: htkseason.github.io

Education

Ph.D. in Computer Science, 2018 - 2023

- Stevens Institute of Technology, Hoboken, NJ, U.S.
- Advisor: Enrique Dunn

B.A. in Software Engineering, 2014 - 2018

- Donghua University, Shanghai, China

Working Experiences

Apple Inc., 2023 - Present

- Computer Vision Engineer at VIO/SLAM group
- Working on VIO/SLAM+ML related problems in Apple Vision Pro etc.
- Manager: Stergios I. Roumeliotis

NEC Laboratories America, 2022 Summer

- Research Intern
- Worked on 3D object localization for autonomous driving.
- Mentor: Manmohan Chandraker, Bingbing Zhuang

Zillow Inc., 2021 Summer

- Applied Scientist Intern
- Worked on ML-based indoor localization.
- Mentor: Sing Bing Kang, Ivaylo Boyadzhiev

Research Interests

- **Intersection of 3D Vision and Machine Learning** (e.g., Structure-from-Motion, SLAM, 3D Localization, 3D Reconstruction, Semantic 3D Understanding, Image-based Rendering)

Publications

Geometric Viewpoint Learning with Hyper-Rays and Harmonics Encoding

- *Zhixiang Min*, Juan Carlos Dibene, Enrique Dunn
- ICCV 2023
- (Novel geometric primitives and fundamentals for 6DoF viewing space metric learning.)

General Planar Motion from a 3D point pair

- Juan Carlos Dibene, *Zhixiang Min*, Enrique Dunn
- ICCV 2023 (Oral presentation. Top 5% submissions.)
- (A 2-point algorithm for planar motion estimation without assuming the knowledge of motion plane.)

NeurOCS: Neural NOCS Supervision for Monocular 3D Object Localization

- **Zhixiang Min**, Bingbing Zhuang, Samuel Schulter, Buyu Liu, Enrique Dunn, Manmohan Chandraker
- CVPR 2023
- (A low-rank categorical shape NeRF representation for high quality NOCS supervision. Our method ranked 1st among KITTI monocular object localization benchmark at the time of submission.)

LASER: LATent SpAcE Rendering for 2D Visual Localization

- **Zhixiang Min**, Naji Khosravan, Zachary Bessinger, Manjunath Narayana, Sing Bing Kang, Enrique Dunn, Ivaylo Boyadzhiev
- CVPR 2022 (Oral presentation. Top 4% submissions.)
- (A cross-modal rendering method for image-based Monte-Carlo localization on 2D floor plans. Featuring in highly efficient sampling, lidar-level accuracy, and strong geometric interpretability.)

VOLDOR-SLAM: For the times when feature-based or direct methods are not good enough

- **Zhixiang Min**, Enrique Dunn
- ICRA 2021
- (SLAM extension for VOLDOR, ranked 2nd on TartanAir SLAM challenge.)

VOLDOR: Visual Odometry from Log-logistic Dense Optical flow Residuals

- **Zhixiang Min**, Yiding Yang, Enrique Dunn
- CVPR 2020 (Oral presentation. Top 5.7% submissions.)
- (First GPU realtime visual odometry method using dense optical flows. VOLDOR is accurate and robust to challenging photometric conditions where traditional SLAM methods frequently fail.)

Patent Applications

- Neural Shape for 3D Object Localization, U.S. Patent Application 63/421,607
- Automated analysis of visual data of images to determine the images' acquisition locations on building floor plans, CA3179102A1
- System and Method for Visual Odometry from Log-Logistic Dense Optical Flow Residuals, WO2021243281A9

Professional Services

- Reviewer for [CVPR21-24], [ICCV21,23], [ECCV22,24], [IROS 22,23], [ICRA 24], [WACV 22-24]

Programming Skills

- | | Competent Familiarity | Fundamental Familiarity |
|--------------|--------------------------------|-------------------------|
| • Languages: | [C/C++, CUDA, Python] | [Matlab, Java, Bash] |
| • Tools: | [Pytorch, Numpy, Ceres, Eigen] | [OpenGL, CMake] |