

# Zhixiang Min

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## 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
- Supervisor: 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 indoor localization.
- Mentor: Sing Bing Kang, Ivaylo Boyadzhiev

## Research Interests

- General 3D Computer Vision, Structure-from-Motion, SLAM, 3D Reconstruction, 3D Localization, 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 2<sup>nd</sup> 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

- Conference Reviewer for [CVPR 2021-2023], [ICCV 2021-2023], [ECCV 2022], [IROS 2022-2023], [WACV 2022-2024]

## Programming Skills

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