Zhixiang Min

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Working Experiences

Senior Computer Vision Engineer, Apple Inc., 2023 - Present
- VIO/SLAM group
- Lead end-to-end development of low-power, all-day localization systems, covering data collection, large-scale model training, optimization, automated evaluation, and on-device deployment.
- Design and ship production-grade ML algorithms for SLAM, VIO, and IMU sensor fusion, deployed at scale on iPhone and Apple Vision Pro.
- Manager: Stergios I. Roumeliotis

Research Intern, NEC Laboratories America, 2022 Summer
- 3D object localization for autonomous driving.
- Mentor: Manmohan Chandraker, Bingbing Zhuang

Applied Scientist Intern, Zillow Inc., 2021 Summer
- ML-based indoor localization.
- Mentor: Sing Bing Kang, Ivaylo Boyadzhiev

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

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

DRaM-LHM: A Quaternion Framework for Iterative Camera Pose Estimation
- Chen Lin, Weizhi Du, **Zhixiang Min**, Baochen She, Enrique Dunn, Sonya M Hanson
- ICCV 2025

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]