Zhixiang Min

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Education

Ph.D. in Computer Science, 2018 - Present

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

B.A. in Software Engineering, 2014 - 2018

- Donghua University, Shanghai, China

Research Interests

- General 3D Computer Vision, Structure-from-Motion, SLAM, 3D Reconstruction, 3D Localization, Semantic 3D Understanding, Image-based Rendering

Working Experiences

NEC Laboratories America, 2022

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

Zillow, 2021

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

Publications

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. Acceptance rate 4%.)
- (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. Acceptance rate 5.7%.)
- (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.)

Geometric Viewpoint Learning with Hyper-Rays and Harmonics Encoding

- ***Zhixiang Min***, Juan Carlos Dibene, Enrique Dunn
- Under Review (Submitted in Mar.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
- Under Review (Submitted in Mar.2023)
- (A 2-point algorithm for planar motion estimation without assuming the knowledge of motion plane.)

Patent Applications

- Neural Shape for 3D Object Localization, U.S. Patent Application 63/421,607
- Neural Network-Based Image Localization on Floor Plans, U.S. Patent Application 17/897,154
- System and Method for Visual Odometry from Log-Logistic Dense Optical Flow Residuals, International PCT Application, PCT/US2021/034981

Professional Services

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

Programming Skills

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