

Yiren LU

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EDUCATION

Case Western Reserve University

Ph.D. in Computer Science

Outstanding Graduate Research Award(2024)

Kevin J. Kranzusch Fellowship(2024-2025)

Cleveland, OH, USA

2024/01-present

University at Buffalo, State University of New York

M.S. in Computer Science and Engineering

Buffalo, NY, USA

2022/08-2023/12

ShanghaiTech University

B.Eng. in Computer Science

Shanghai, China

2017/09-2021/08

RESEARCH FOCUS

3D/4D Reconstruction(Gaussian Splatting, NeRF), 3D/4D Generation, Scene Understanding, 3D Perception

SELECTED PUBLICATIONS

- **Lu, Y.,** Zhou, Y., Liu, D., Liang, T., Yin, Y. "BARD-GS: Blur-Aware Reconstruction of Dynamic Scenes via Gaussian Splatting". Accepted to **CVPR 2025**.
- **Lu, Y.,** Ma, J., & Yin, Y. (2024, October). "View-consistent Object Removal in Radiance Fields". In Proceedings of the 32nd ACM International Conference on Multimedia (**MM**).
- **Lu, Y.,** Zhou, Y., Qiao, Y., Song, C., Ma, J., Yin, Y. "UniOVS: A Unified Approach for 3D-Aware Open Vocabulary Segmentation based on Gaussian Splatting". Submitted to **ICCV 2025**.
- Hu, Z., Liang, T., Li, J., **Lu, Y.,** ... & Yin, Y. "Cracking the Code of Juxtaposition: Can AI Models Understand the Humorous Contradictions". Advances in Neural Information Processing Systems (**NeurIPS Oral**), 2024.
- Zhan, Z., Li, X., Li, Q., et al. "PyPose v0.6: The Imperative Programming Interface for Robotics". 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**) workshop.
- Tai, F., Su, S., **Lu, Y.,** Chen, W. "iSLAM: Imperative SLAM," IEEE Robotics and Automation Letters (**RA-L**), 2024.
- **Lu, Y.,** Wei, H. (2023). "End to End Face Reconstruction via Differentiable PnP". In: Karlinsky, L., Michaeli, T., Nishino, K. (eds) Computer Vision – 2022 European Conference on Computer Vision (**ECCV**) Workshops.
- Zhi, X., Hou, J., **Lu, Y.,** Kneip, L. and Schwertfeger, S., "Multical: Spatiotemporal Calibration for Multiple IMUs, Cameras and LiDARs," 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**).
- Cai, J., Hou, J., **Lu, Y.,** et al, "Improving CNN-based Planar Object Detection with Geometric Prior Knowledge", 2020 IEEE International Symposium on Safety, Security, and Rescue Robotics (**SSRR**).

WORK EXPERIENCES

Tencent

Applied Scientist Intern, Interactive Entertainment Group (IEG)

Shenzhen, China

2021/07-2022/06

Fast Human 3D Motion Capture Pipeline for Live Streaming

- Constructed a 30-fps real-time Multiview human motion capture system for live streaming with latency less than 1s.
- Utilized Mediapipe as 2d key-point detector and applied triangulation to get 3d coordinate of each key-point.
- Leveraged optimization methods such as SMPLify and SCOPE to regress body SMPL parameters, and used information of previous frames to speed up the optimization process.
- Extracted the minimal-ik module from minimal-hand to calculate hand MANO parameters.

RESEARCH EXPERIENCES

Blur-Aware Reconstruction of Dynamic Scenes via Gaussian Splatting (CVPR'25)

2024/06-2024/11

[VU Lab](#), Case Western Reserve University.

Research Assistant (Advisor: Prof. Yu, Yin)

- Proposed BARD-GS, a blur-aware dynamic scene reconstruction framework, to tackle challenges posed by blurry inputs and imprecise camera poses.

- Decoupled Object motion blur from camera motion blur and modeled each separately in an explicit manner, resulting in a substantial improvement in reconstruction quality within dynamic regions.
- A new real-world motion blur dataset is proposed for evaluating the novel view synthesis performance under real-world blurry scenarios.

View-consistent Object Removal in Radiance Field (ACM MM'24)

2024/10-2024/04

VU Lab, Case Western Reserve University.

Research Assistant (Advisor: Prof. Yu, Yin)

- Proposed a novel Radiance Field inpainting method that requires inpainting only one reference view and automatically propagates the inpainted content to all other views, which significantly enhances efficiency and consistency across multiple views.
- Designed a directional variants generation module to adjust the appearance of projected views to enhance the photorealism of the synthesized views.
- A fast and robust multi-view segmentation approach is proposed to facilitate precise location and removal of objects.

iSLAM: Imperative SLAM (RA-L'24)

2023/03-2023/10

SAIR Lab, University at Buffalo.

Research Intern (Advisor: Prof. Chen Wang)

- Proposed a novel self-supervised learning framework for SLAM, enabling mutual correction between the front-end and back-end. This cooperative symbiosis fosters geometric knowledge learning in the front-end and accuracy improvement in the back-end, thereby enhancing the system's overall performance.
- Designed an IMU denoising network integrated with IMU pre-integration, combined with a learning based Visual Odometry (VO) to serve as front-end. A pose-velocity graph optimization (PVGO) is used to serve as back-end. This system is used to verify the proposed framework.
- By applying iSLAM, the front-end odometry and IMU networks are improved by an average accuracy of 22% and 4%, respectively, while the back-end also experienced a 10% enhancement.

End-to-End Face Reconstruction via Differentiable PnP (ECCV'22 Workshop)

2022/05-2022/08

Applied Scientist Intern, Tencent.

- Designed a two-branch network to deal with the Face Reconstruction and Facial Landmark Detection task.
- Applied the Gaussian Negative Log Loss (GNLL) to improve the accuracy of Facial Landmark Detection.
- Constructed a 250-dimension PCA space for canonical 3d mesh and utilized VDC and fWPDC loss to regress 3d mesh. Finally achieved a SOTA performance with 1.68mm mean error on ARKit dataset.
- Utilized the differentiable EPro-PnP to overcome the training problem of the previous PnP methods, and reached a SOTA performance on head pose estimation with an MAE of 0.81 and 3.86 on Rotation and Translation respectively.

Multical: Spatiotemporal Calibration for Multiple IMUs, Cameras and LiDARs (IROS'22)

2020/07-2021/07

The MARS Lab, School of Information Science and Technology, ShanghaiTech University.

Research Intern (Supervisor: Prof. Sören Schwertfeger)

- Designed an algorithm to calculate the transformation between LiDAR and the arbitrary target using the geometric and intensity information captured by LiDAR. Finally reached a 0.71mm transformation error and 0.003rad rotation error in real word when estimating the pose of the AprilGrid board.
- Conducted the real-world temporal calibration experiment, which showed a 0.003ms time offset error when there was a 3ms artificial delay on IMU data.
- Constructed the calibration platform with four cameras and two LiDARs, and responsible for data collection.
- Used Gazebo to simulate the data collection process.

PROFESSIONAL SERVICES

Conference Reviewer

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| • IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) | 2024, 2025 |
| • International Conference on Computer Vision (ICCV) | 2025 |
| • Annual AAAI Conference on Artificial Intelligence (AAAI) | 2025 |
| • ACM Multimedia (MM) | 2024 |