RENJIE LI

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RESEARCH INTERESTS

3D Representation & Reconstruction, 3D Generation, Multi-task Learning, Point Cloud Registration

EDUCATION

Texas A&M University   2024.08 – Present
Ph.D. Student, Computer Science   Advisor: Zhengzhong Tu
Tsinghua University, China   2020.08 – 2024.07
Ph.D. Student, Software Engineering   Advisor: Yue Gao
Tsinghua University, China   2016.08 - 2020.06
Bachelor, Software Engineering

PROFESSIONAL EXPERIENCE

ByteDance, China   2023.11 – 2024.08
Research Intern   Supervisor: Zeming Li

RESEARCH PROJECTS

3D Scene Modeling   2023 - Present
Multi-task label representation and rendering: In our *VersatileGaussian*☐ paper (ECCV'24), we achieve high-quality and real-time novel view rendering of multi-task labels by enabling 3D Gaussian Splatting with multi-task learning. With the proposed feature map rasterizer and Task Correlation Attention module, We achieve sota MT accuracy and real-time rendering on the ScanNet and Replica dataset. Notably, this model design facilitates mutual benefits across tasks, leading to improved quality in novel view synthesis.
General semantic 3D reconstruction: In our *LSM* ☐ paper (NeurIPS'24), we achieve reconstructing geometry, appearance, and semantics of 3D scenes using two unposed and uncalibrated images. Our method simultaneously infers geometry, appearance, and semantics within a scene, and synthesizes versatile label maps at novel views, all in a single feed-forward pass.

3D Scene Generation   2023 - Present
Dynamic Panoramic Scene Generation: Our *4K4DGen*☐ paper (ICLR'25). We achieve generating dynamic panoramic scenes from a static panorama at 4K resolution. We propose a novel panoramic animator to generate a panoramic video from a static panorama as a reference, which is consistent at all perspective views. Then we lift the panoramic video to a spatially and temporally consistent 4D representation, by optimizing at all perspective views.

PUBLICATION

R. Li, P. Pan, B. Yang, D. Xu, S. Zhou, X. Zhang, Z. Li, A. Kadambi, Z. Wang, Z. Fan, "4K4DGen: Panoramic 4D Generation at 4K Resolution" **ICLR 2024**.
R. Li, Z. Fan, B. Wang, P. Wang, Z. Wang, X. Wu, "VersatileGaussian: Real-time Neural Rendering for Versatile Tasks using Gaussian Splatting" **ECCV 2024**.
Z. Fan, J. Zhang, W. Cong, P. Wang, R. Li, K. Wen, S. Zhou, A. Kadambi, Z. Wang, D. Xu, B. Ivanovic, M. Pavone, Y. Wang, "Large Spatial Model: Real-time Unposed Images to Semantic 3D" **NeurIPS 2024**.

AWARDS

Excellent Teaching Assistant Award in Tsinghua University   2023
Philobiblon Scholarship   2019
Excellent Academic Scholarship of Tsinghua University   2018
National Olympiad in Informatics, Bronze medal   2015