

Ziyang Xie

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EDUCATION

University of Illinois Urbana-Champaign | *Master of Science in Computer Science* | GPA 4.0/4.0 Aug. 2023 – May. 2025
Fudan University | *Bachelor of Science in Computer Science* Sept. 2019 – Jul. 2023

RESEARCH INTERESTS

My research interests mainly focus on **3D Vision** and **Scene Representations**. I have a particular focus on 3D neural representation methods (NeRF/3DGS) and their applications in autonomous-driving and robotics fields.

I envision the future of 3D vision research as the development of a comprehensive **foundation model**. It would not only facilitate the reconstruction and generation of highly detailed 3D scenes but also intuitively understand and simulate the underlying physical interactions within these environments.

SELECTED PUBLICATIONS

- **S-NeRF: Neural Radiance Fields for Street Views** ICLR, 2023
*Ziyang Xie**, Junge Zhang*, Wenye Li, Feihu Zhang, Li Zhang
- **MV-Map: Offboard HD-Map Generation with Multi-view Consistency** ICCV, 2023
*Ziyang Xie**, Ziqi Pang*, Yu-Xiong Wang
- **Frozen transformers in language models are effective visual encoder layers** ICLR, 2024 (Spotlight*)
Ziqi Pang, *Ziyang Xie**, Yunze Man*, Yu-Xiong Wang
- **S-NeRF++: Autonomous Driving Simulation via Neural Reconstruction and Generation** Under Review
Yurui Chen, Junge Zhang, *Ziyang Xie*, Wenye Li, Feihu Zhang, Jiachen Lu, Li Zhang

SELECTED RESEARCH EXPERIENCES

Encoding consistent 3D feature field (Current Project) Oct. 2023 - Present

Explore how to construct a general 3D feature field for downstream 3D vision tasks.

- **Main Task:** Lift any 2D feature to a 3D consistent feature field in a feed-forward way and apply the pretrained auto-encoder to various downstream tasks in 3D vision.
- **Key Idea:** Train a general 2d-to-3d lifter in a self-supervised manner using volume rendering as a decoder.
- **Highlights:** Real-time feature field construction without time-consuming distillation from NeRF training.

MV-Map: Offboard HD-Map Generation with Multi-view Consistency (ICCV 2023) July. 2022 - May 2023

Explore how we can apply neural radiance field in self-driving tasks (HD-Map generation).

- **Main Task:** Proposed an uncertainty based offboard HD-Map generation pipeline that enhance HD-Map generation quality through ensuring multi-view consistency.
- **Key Idea:** Using temporal offboard fusion and NeRF to ensure multi-view consistency in HD-Map generation.
- **Highlights:** Compatible with any online HD-Map generation model as a plug-and-play approach, this paper is among the first to investigate the integration of Neural Radiance Fields into standard 3D vision tasks.

Research Assistant (Li Zhang's group)

Fudan University

S-NeRF: Neural Radiance Fields for Street Views (ICLR 2023)

Jan. 2022 - Aug. 2022

Large-scale Neural Reconstruction on self-driving scenes

- **Main Task:** Reconstruct high-quality self-driving scenes and foreground moving vehicles with limited data.
- **Key Idea:** Leverage dense depth supervision with confidence score for high quality scene reconstruction.
- **Highlights:** The *first* paper manages to reconstruct both background street scenes and foreground vehicles with high quality on public self-driving datasets (nuScenes/Waymo)

Other Research Experience:

(Text/FMRI)-to-3D generation, VLM agents, World Model, BEV detection.