

Ziyang Xie

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EDUCATION

School of Computer Science, Fudan University

Sept. 2019 - Jul. 2023

B.S. in Computer Science

Core Courses : Computer Vision (A), Natural Language Processing (A), Mathematical Analysis II (A),

Graph and Group Theory *Topnotch (A), Introduction to Computer System *Honor (A)

RESEARCH EXPERIENCES

Research Assistant / Summer Internship, *University of Illinois Urbana-Champaign (UIUC)*

Jun. 2022 - Nov. 2022

Advisor: Assistant Professor [Yuxiong Wang](#), Department of CS at UIUC / Ph.d. student [Ziqi Pang](#), Department of CS at UIUC

NeuralMap: NeRF-Guided Uncertainty-Aware Fusion for Offboard HD-Map Generation

- Proposed a novel offboard high-definition (HD) maps generation model (NeuralMap) for offline auto labeling. Our key insight is to leverage voxel neural radiance fields (NeRFs) to guide the fusion process. To identify the most contributing frames and image regions for optimizing the HD-Maps, we propose a novel uncertainty network based on the geometry information provided by Voxel-NeRF to fuse local maps into a more accurate consistent long-range map.
- Extensive experiments on nuScenes show that our NeuralMap significantly improves the quality of generated HD-Maps.

Research Assistant, Fudan Zhang Vision Group, *Fudan University*

Jan. 2022 - May. 2022

Advisor: Associate Prof. [Li Zhang](#), School of Data Science / [Feihu Zhang](#) in Torr Vision Group at University of Oxford

S-NeRF: Neural Radiance Fields for Street Views

- In this paper, we proposed a new street-view NeRF (S-NeRF) that jointly considers novel view synthesis of both the large-scale background scenes and the foreground moving vehicles. We proposed to use the noisy and sparse LiDAR points to boost NeRF training and learn a robust geometry and reprojection based confidence to address the depth outliers.
- Thorough experiments on the large-scale driving datasets (e.g., nuScenes and Waymo) demonstrate that our method beats the state-of-the-art rivals by reducing 7~40% of the mean-squared error in the street-view synthesis.
- Our research demo was demonstrated at the 2022 WAIC (World Artificial Intelligence Conference) Opening Ceremony.

PUBLICATIONS

- **NeuralMap: NeRF-Guided Uncertainty-Aware Fusion for Offboard HD-Map Generation**

Ziyang Xie, Ziqi Pang, Yu-Xiong Wang, CVPR, 2023 (under review)

- **S-NeRF: Neural Radiance Fields for Street Views**

Ziyang Xie, Junge Zhang*, Wenye Li, Feihu Zhang, Li Zhang, ICLR, 2023*

*([OpenReview Link](#)), * represents equal contribution)*

INDUSTRY INTERNSHIP

SenseTime Autonomous Vehicle Researcher

Feb. 2022 - July. 2022

- Motivate my manager to kick off the research on self-driving simulation with NeRF. Integrate my S-NeRF research into enterprise business and to develop a driving simulation product prototype for data augmentation on 3D object detection.
- Develop computer vision perception algorithms for autonomous driving, including: target detection, segmentation, attribute understanding, 3D point cloud detection, model compression and quantification, knowledge distillation and other tasks.

AWARDS

- Fudan University Excellent Student Sept. 2020
- Fudan University Student Professional Minor Scholarship (Ranking: 8/101) Sept. 2020
- QingYun Scholar (Fudan Elite Undergraduate Research Funding Scheme) Apr. 2021
- Chun-Tsung Endowment Researcher Jul. 2021

LEADERSHIP AND ACTIVITIES

Huawei Student Development | Fudan University | Leader

Jul. 2021 - Jul. 2022

- Organize school tech work-shop among students facing different tech stack
- Develop amazing open-source software products to implement creative ideas

SKILLS

Programming Languages: C/C++, Python, JavaScript, TypeScript, GoLang, Rust

Libraries: Pytorch, Torch-Vision, Scikit-learn, Numpy, Pandas, Vue