TIANYUAN YUAN

Tsinghua University, Beijing, China
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EDUCATION

IIIS, Tsinghua University, Beijing, China — Sep 2022 – Jul 2027
PhD of Computer Science and Technology
GPA: 3.78/4.00

Yuanpei College, Peking University, Beijing, China — Sep 2018 – Jul 2022
Bachelor of Computer Science and Technology
GPA: 3.60/4.00 (Rank 1/27)

WORK EXPERIENCE

Galaxea AI, Beijing — Dec 2024 - Now
Research Intern

- Leading the pre-training of the large-scale Vision-Language-Action Model **G0**.

ByteDance, Beijing — Jan 2021 - Mar 2021
Research Intern

- Responsible for the research and improvement of TikTok's overseas video content safety monitoring algorithms, understanding the business logic of video safety, learning TikTok's safety monitoring technology roadmap, and working on developing and improving video safety detection algorithms.

Megvii, Beijing — Jul 2020 - Dec 2020
Research Intern

- Developed and improved 3D object detection algorithm on autonomous driving scenarios. Algorithm outperforms the group's original one in both accuracy and efficiency. Plugged the algorithm into operation pipeline.
- Won outstanding intern award.

RESEARCH EXPERIENCE

Embodied AI

- **G0:** Galaxea Open-World Dataset and G0 Dual-System VLA Model.

Autonomous Driving Map Construction

- **VectorMapNet:** Proposed an end-to-end vectorized HD map learning pipeline termed VectorMapNet, which takes onboard sensor observations and predicts a sparse set of polylines in the bird's-eye view.
- **Neural Map Prior:** Proposed Neural Map Prior (NMP), a neural representation of global maps that facilitates automatic global map updates and improves local map inference performance.
- **StreamMapNet:** Proposed StreamMapNet, an end-to-end online pipeline that utilizes camera videos with a temporal fusion strategy to construct temporal-consistent high-quality vectorized maps covering a wide range.

Neural Reconstruction

- **PreSight:** a novel framework, Pre-Sight, that leverages past traversals to construct static prior memories using NeRF, enhancing online perception in later navigations.

3D Object Detection

- **Intern Project at Megvii:** Developed a 3D object detection based on private datasets. Innovatively adopted the anchor-free FCOS model on 3D object detection. Surpassed key-point-based 3D detection baselines in the group.
  4DAutolabeling (Bachelor Graduation Project): Proposed a novel automatic data-labeling pipeline named 4DAutolabeling. Evaluated on the popular nuScenes dataset, our method generates high-quality pseudo-labels and boosts the performance of detectors by using semi-supervised techniques.

PUBLICATIONS

1. **Tianyuan Yuan**, Yicheng Liu, Yue Wang, Yilun Wang, Hang Zhao. StreamMapNet: Streaming Mapping Network for Vectorized Online HD Map Construction. Accepted by WACV, 2024.
2. **Tianyuan Yuan**, Yucheng Mao, Jiawei Yang, Yicheng Liu, Yue Wang, Hang Zhao. PreSight: Enhancing Autonomous Vehicle Perception with City-Scale NeRF Priors. Submitted to ECCV, 2024.
3. Tao Jiang*, **Tianyuan Yuan***, Yicheng Liu*, Chenhao Lu, Jianning Cui, Xiao Liu, Shuiqi Cheng, Jiyang Gao, Huazhe Xu, Hang Zhao. Galaxea Open-World Dataset and G0 Dual-System VLA Model.

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4. Yunshen Wang*, Yicheng Liu*, **Tianyuan Yuan***, Yingshi Liang, Xiuyu Yang, Honggang Zhang, Hang Zhao. Diffusion-Based Generative Models for 3D Occupancy Prediction in Autonomous Driving. Accepted by ICRA, 2025.
5. Xuan Xiong, Yicheng Liu, **Tianyuan Yuan**, Yue Wang, Yilun Wang, Hang Zhao. Neural Map Prior for Autonomous Driving. Accepted by CVPR, 2023.
6. Yicheng Liu, **Tianyuan Yuan**, Yue Wang, Yilun Wang, Hang Zhao. VectorMapNet: End-to-end Vectorized HD Map Learning. Accepted by ICML, 2023.
7. Zhou Jiang, Zhenxin Zhu, Pengfei Li, Huan-ang Gao, **Tianyuan Yuan**, Yongliang Shi, Hang Zhao, Hao Zhao. P-MapNet: Far-Seeing Map Generator Enhanced by Both SDMap and HDMap Priors. Accepted by RAL.