TIANYUAN YUAN

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EDUCATION

IIIS, Tsinghua University, Beijing, China — Sep 2022 - Jul 2027 (Expected)
PhD in Computer Science and Technology
Advisor: Prof. Hang Zhao

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

RESEARCH EXPERIENCE

Embodied AI

Fast-WAM | NIPS 2026 Spotlight

- Studied a key question in WAM learning: Do WAMs benefit mainly from explicit future imagination at inference, or from video modeling during training?
- We proved the main benefit comes from video co-training during training by proposing Fast-WAM, a WAM removes explicit future generation at test time, stays competitive, and runs much faster.

Galaxea G0.5 VLA

- Pretrained our most advanced VLA which understands arbitrary natural-language instructions and interacts with novel objects out of the box, without object-specific engineering.

Galaxea Open-World Dataset & G0 VLA | Project Leader | ICRA 2026

- Constructed a large-scale open-world dataset, **Galaxea Open-World Dataset,** containing 500+ hours of high-quality manipulation data. Curated data pipeline including collection, filtering, annotation and curriculum design.
- Led the pre-training of G0 VLA 3B, a dual-system Vision-Language-Action (VLA) model designed for generalist robot manipulation, which outperforms the pi-0 model on multiple self-hold benchmarks.

DepthVLA: Depth-Aware Spatial Reasoning for VLAs | ICRA 2026

- Proposed **DepthVLA**, a new architecture enhancing VLA models with explicit depth-aware spatial reasoning by adding depth expert into the VLA backbone, significantly improving performance in complex 3D manipulation.

Neural Reconstruction & Memory

LONG3R: Long-Sequence 3D Reconstruction | ICCV 2025

- Utilized streaming memory to build a multi-view 3D scene reconstruction framework capable of processing extremely long video sequences. Achieved real-time processing by implementing a recurrent memory update mechanism.

PreSight: City-Scale Neural Memories for Perception | ECCV 2024

- **Proposed the first framework** leveraging past traversals to construct city-scale neural memories, enhancing online perception for autonomous vehicles in repeated routes.
- Demonstrated significant improvements in downstream perception tasks. Being **deployed on real-world vehicles.**

Online Mapping: Pioneered the field of **end-to-end vectorized HD map construction** in autonomous driving.

- **StreamMapNet (WACV 2024)**: Introduced a temporal fusion strategy powered by recurrent memory to construct stable, large-range HD maps in real-time, solving the inconsistency issue in single-frame predictions.
- **Neural Map Prior (CVPR 2023): Proposed the first neural representation** of global maps that facilitates automatic global map updates and improves local mapping performance. Being **deployed on real-world vehicles.**
- **VectorMapNet (ICML 2023)**: Proposed the first end-to-end vector map learning pipeline.

WORK EXPERIENCE

Galaxea AI | Research Intern | Leader of Pretraining Team — Dec 2024 - Now

- Project leader on G0 VLA model and dataset construction.
- Project Leader on Fast-WAM (World Action Model) architecture design.

SELECTED PUBLICATIONS (* INDICATES EQUAL CONTRIBUTION)

1. Fast-WAM: Do World Action Models Need Test-time Future Imagination? **T. Yuan,** Z. Dong, Y. Liu, H. Zhao. [Arxiv]
2. DepthVLA: Enhancing Vision-Language-Action Models with Depth-Aware Spatial Reasoning. **T. Yuan,** Y. Liu, C. Lu, Z. Chen, T. Jiang, H. Zhao. [ICRA 2026].
3. Galaxea Open-World Dataset and G0 Dual-System VLA Model. T. Jiang*, **T. Yuan***, Y. Liu*, C. Lu, et al. [ICRA 2026].
4. LONG3R: Long Sequence Streaming 3D Reconstruction. Z. Chen*, M. Qin*, **T. Yuan***, Z. Liu, H. Zhao. [ICCV 2025].
5. PreSight: Enhancing Autonomous Vehicle Perception with City-Scale NeRF Priors. **T. Yuan**, Y. Mao, J. Yang, Y. Liu, Y. Wang, H. Zhao. [ECCV 2024].
6. StreamMapNet: Streaming Mapping Network for Vectorized Online HD Map Construction. **T. Yuan**, Y. Liu, Y. Wang, Y. Wang, H. Zhao. [WACV 2024].
7. VectorMapNet: End-to-end Vectorized HD Map Learning. Y. Liu, **T. Yuan**, Y. Wang, Y. Wang, H. Zhao. [ICML 2023].