

TAICHI LIU

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EDUCATION

ShangHai Jiao Tong University

Bachelor Degree in Electrical and Computer Engineering

Sep 2016 – Aug 2020

Tsinghua University

M.S. in Electrical Engineering (Dual Degree), FIB Lab. Supervisor: Prof. Yong Li

Sep 2020 – Aug 2023

Johns Hopkins University

M.S.E in Biomedical Engineering (Dual Degree)

Sep 2021 – Aug 2022

Rutgers University

PhD in Computer Science, GPA: 4.0/4.0, Arsenal Lab. Supervisor: Prof. Desheng Zhang

Sep 2023 – present

RESEARCH EXPERIENCE

Cold-Start Item Recommendation

Tsinghua University, Sep 2022 - Feb 2023

- Propose an uncertainty-aware method to balance cold and warm items in the cold-start recommendation.
- Design a teacher-student consistency learning framework in GNNs to reduce item-level and model-level bias.
- Achieve a 27.6% improvement for all items and more than 7 times improvement for cold items on average.

Towards 3D Objectness Learning in an Open World

Rutgers University, Feb 2024 - Sep 2024

- We are the first to formally define and address class-agnostic open-world 3D object detection in 3D domain.
- Propose the cross-modal mix-of-expert mechanism to boost multi-modal learning in class-agnostic detection.
- Achieve a more than 13.5% improvement compared to existing closed-world and open-vocabulary 3D detectors.

Unified Object Understanding and Generation in MLLMs

Rutgers University, Feb 2025 - Sep 2025

- Design object parser to decompose input data and simplify reasoning process for complex multimodal tasks.
- Propose region-level image generation based on diffusion for multi-object image generation.
- Achieve 17% improvement on image generation tasks and 3% improvement on image understanding tasks.

INTERN EXPERIENCE

User Consumption Intention Prediction

User Profile Group, Meituan, Sep 2020 - July 2021

- Integrate our intention prediction model into the recall engine of the recommender systems in MeiTuan, and feed the improved pool into the ranking engine for the final recommendation.
- Online A/B tests show the page view for cold-start customers improves in a new business unit by 11.79% and 83.9% customer growth rate across all business units compared to traditional models.

PUBLICATIONS

[**Preprints**] **Taichi Liu**, Zhenyu Wang, Yan Bai, Fei Xia, Hengshuang Zhao, “UniOUG: Empowering Large Multimodal Models with Unified Object-Level Understanding and Generation.”

[**NeurIPS 2025**] **Taichi Liu**, Zhenyu Wang, Ruofeng Liu, Guang Wang, Desheng Zhang, “Towards 3D Objectness Learning in an Open World.”

[**SIGIR 2023**] **Taichi Liu**, Chen Gao, Zhenyu Wang, Dong Li, Jianye Hao, Depeng Jin, Yong Li, “Uncertainty-aware Consistency Learning for Cold-Start Item Recommendation.”

[**ECCV 2024**] Zhenyu Wang, Yali Li, **Taichi Liu**, Hengshuang Zhao, Shengjin Wang, “OV-Uni3DETR: Towards Unified Open-Vocabulary 3D Object Detection via Cycle-Modality Propagation.”

[**CIKM 2024**] Guang Yang, Meiqi Tu, Zelong Li, Jinqian Hang, **Taichi Liu**, Ruofeng Liu, Yi Ding, Yu Yang, Desheng Zhang, “Behavior-Aware Hypergraph Convolutional Network for Illegal Parking Prediction with Multi-Source Contextual Information.”

[**KDD 2021**] Yukun Ping, Chen Gao, **Taichi Liu**, Xiaoyi Du, Hengliang Luo, Depeng Jin, Yong Li, “User Consumption Intention Prediction in Meituan.”