

Xin LAI — 赖昕

✉ xinlai@cse.cuhk.edu.hk

☎ +86 188 4604 4208

Age: 25 years old



Introduction

I am currently a final-year Ph.D student at CUHK, supervised by [Prof. Jiaya Jia](#) (IEEE Fellow). My research interests lie in Multimodal Large Language Model, Long-step Reasoning with LLMs, 2D/3D Scene Understanding, Vision Transformer. My representative works include [LISA](#) (enabling multi-modal LLMs with reasoning segmentation capabilities) and [Stratified Transformer](#) (a fully transformer-based 3D fundamental network). [[Google Scholar](#)]

Education Background

The Chinese University of Hong Kong (CUHK)

Ph.D Student of Computer Science and Engineering

Supervisor: [Prof. Jiaya Jia](#) (IEEE Fellow).

Hong Kong, China

Aug. 2020-Aug. 2024 (Expected)

Harbin Institute of Technology (HIT)

Bachelor of Computer Science and Technology

GPA: 93.8/100, Ranking: 1st / 39 in Computer Engineering track

Harbin, China

Sept. 2016-Jun. 2020

The University of Hong Kong (HKU)

Exchange Student of Computer Science

Hong Kong, China

Sept. 2018-Jan. 2019

Publications

1. LISA: Reasoning Segmentation via Large Language Model

Xin Lai, Zhuotao Tian, Yukang Chen, Yanwei Li, Yuhui Yuan, Shu Liu, Jiaya Jia

Computer Vision and Pattern Recognition (CVPR), 2024. [[Paper](#)][[Code](#)]

Over 1,300 GitHub Stars! Invited to give a talk at Adobe (California, US) and other institutions. Reported by top-tier technology media. [[量子位](#)] [[Twitter](#)] [[机器之心](#)] [[CVer](#)]

2. Mask-Attention-Free Transformer for 3D Instance Segmentation

Xin Lai, Yuhui Yuan, Ruihang Chu, Yukang Chen, Han Hu, Jiaya Jia

International Conference on Computer Vision (ICCV), 2023. [[Paper](#)][[Code](#)]

3. Spherical Transformer for LiDAR-based 3D Recognition

Xin Lai, Yukang Chen, Fanbin Lu, Jianhui Liu, Jiaya Jia

Computer Vision and Pattern Recognition (CVPR), 2023. [[Paper](#)][[Code](#)]

4. Stratified Transformer for 3D Point Cloud Segmentation

Xin Lai, Jianhui Liu, Li Jiang, Liwei Wang, Hengshuang Zhao, Shu Liu, Xiaojuan Qi, Jiaya Jia

Computer Vision and Pattern Recognition (CVPR), 2022. [[Paper](#)][[Code](#)]

A pioneering fully transformer-based 3D network. Invited to give a talk at Microsoft Research Asia (MSRA).

5. DecoupleNet: Decoupled Network for Domain Adaptive Semantic Segmentation

Xin Lai, Zhuotao Tian, Xiaogang Xu, Yingcong Chen, Shu Liu, Hengshuang Zhao, Liwei Wang, Jiaya Jia

European Conference on Computer Vision (ECCV), 2022. [[Paper](#)][[Code](#)]

6. Semi-supervised Semantic Segmentation with Directional Context-aware Consistency

Xin Lai, Zhuotao Tian, Li Jiang, Shu Liu, Hengshuang Zhao, Liwei Wang, Jiaya Jia

Computer Vision and Pattern Recognition (CVPR), 2021. [[Paper](#)][[Code](#)]

7. LongLoRA: Efficient Fine-tuning of Long-Context Large Language Models

Yukang Chen, Shengju Qian, Haotian Tang, Xin Lai, Zhijian Liu, Song Han, Jiaya Jia

International Conference on Learning Representations (ICLR), 2024. **Oral Presentation** [[Paper](#)][[Code](#)]

Over 2.3k GitHub Stars! Reported by top-tier technology media. [[量子位](#)] [[Twitter](#)]

8. **Learning Context-aware Classifier for Semantic Segmentation**
Zhuotao Tian, Jiequan Cui, Li Jiang, Xiaojuan Qi, **Xin Lai**, Yixin Chen, Shu Liu, Jiaya Jia
AAAI Conference on Artificial Intelligence (AAAI), 2023. [[Paper](#)]
9. **Generalized Few-shot Semantic Segmentation**
Zhuotao Tian, **Xin Lai**, Li Jiang, Michelle Shu, Hengshuang Zhao, Jiaya Jia
Computer Vision and Pattern Recognition (CVPR), 2022. [[Paper](#)][[Code](#)]
10. **Adaptive Perspective Distillation for Semantic Segmentation**
Zhuotao Tian, Pengguang Chen, **Xin Lai**, Li Jiang, Shu Liu, Hengshuang Zhao, Bei Yu, Ming-Chang Yang, Jiaya Jia
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2022.
11. **Guided Point Contrastive Learning for Semi-supervised Point Cloud Semantic Segmentation**
Li Jiang, Shaoshuai Shi, Zhuotao Tian, **Xin Lai**, Shu Liu, Chi-Wing Fu, Jiaya Jia
International Conference on Computer Vision (ICCV), 2021. [[Paper](#)]

Experiences

- **Tencent ARC Lab** July, 2023 - Jan., 2024
 - Mentor: Dr. [Yanpei Cao](#)
 - Internship: Working on the intersection between Multi-modal Large Language Model and vision tasks.
- **Microsoft Research Asia (MSRA)** Dec., 2022 - May, 2023
 - Mentor: Dr. [Yuhui Yuan](#), Dr. [Han Hu](#)
 - Collaboration: Working on the transformer-based method for 3D Point Cloud Instance Segmentation.
 - 1st on ScanNetv2 & ScanNet200 3D instance segmentation benchmark (March 2023)
- **SmartMore** July, 2020 - Dec., 2022
 - Mentor: Dr. [Shu Liu](#)
 - Internship: Working on 2D/3D scene understanding, semi-supervised, domain adaptive segmentation.
 - Early exploration of fully transformer-based 3D fundamental network (Stratified Transformer).
 - Plug-and-play radial transformer module to enhance distant objects recognition (Spherical Transformer).
 - 1st on nuScenes & SemanticKITTI 3D semantic segmentation benchmark (Nov., 2022)

Open-source Projects

- **Sparse Transformer (SpTr)** [[Code](#)]
A fast, memory-efficient, and easy-to-use library for sparse transformer with varying token numbers (e.g., window transformer for 3D point cloud). It is highly optimized by underlying CUDA code.
Author: **Xin Lai** (the core contributor, contributions include optimization ideas, all code writing, testing, and time evaluation), Fanbin Lu, Yukang Chen

Awards

- Outstanding Reviewer *by CVPR, 2023*
- Full Postgraduate Studentship 2020-2024
- Outstanding Graduate *by HIT, 2020*
- National Scholarship (Top 1%) *by Chinese Ministry of Education, 2018*
- Fung Scholarship *by Victor and William Fung Foundation Ltd., 2018*
- Provincial Merit Student (Top 2%) 2018
- People's Scholarship *by HIT, 2016-2018*

Invited Talks

- "LISA: Reasoning Segmentation via Large Language Model" at **Adobe (California, US)**
- "Stratified Transformer" at **Microsoft Research Asia (MSRA)** [[Slides](#)]
- "Spherical Transformer" at **TechBeat 2023** [[Slides](#)]
- "DecoupleNet" at **AI Times 2022** [[Slides](#)]

Activities & Teaching

- Reviewer for CVPR, ICCV, ECCV, NeurIPS, IJCV, TIP, Pattern Recognition.
- Teaching Assistant: ENGG 1110: Problem Solving By Programming / CSCI 3251: Engineering Practicum