

# Pengxiang Li

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pixeli99.github.io

## Education

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- **Dalian Maritime University** Sep 2018 – Jun 2022  
BSc in Geographic Information Science
- **Dalian University of Technology** Sep 2022 – Jun 2025  
MSc in Artificial Intelligence, IIAU Lab (Supervisor: Huchuan Lu)  
*Key Courses:* Linear Algebra, Probability and Statistics, Matrix Computations, Machine Learning, etc.
- **The Hong Kong Polytechnic University** Expected Sep 2025  
PhD in Artificial Intelligence (Supervisor: Hongxia Yang)

## Research Interests

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- Large Language Models, Diffusion Language Models

## Project Experience

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- **Corner Case Mining Based on Temporal Relationship (Noah's Ark Lab)** Dec 2022 – Jul 2024  
**Benchmark Construction and Evaluation:** By leveraging GPT-4V, a multimodal visual-language dataset called CODA-LM was created. This dataset covers three sub-tasks: holistic perception, local perception, and driving advice tasks. To evaluate this dataset, we developed an automated evaluation framework specifically designed to assess the capabilities of MLLMs in the domain of autonomous driving.  
**MLLM Development for Autonomous Driving:** Based on the LLaVA paradigm, images are subdivided into multiple sub-images with a LoRA module incorporated into the visual encoder to handle different sub-images, allowing for increased input image resolution. The training dataset was organized into an instruction fine-tuning format, and DeepSpeed technology was used for instruction fine-tuning training. This approach enhanced the MLLM's capability to understand corner case scenarios.
- **Oversmoothing in Large Language Models** Mar 2024 – Jul 2024  
Conducted collaborative research with the University of Oxford and the University of Surrey on token oversmoothing caused by positional bias in the attention layer.
- **VLA for Driving (RA, Tsinghua MARS Lab)** Jun 2024 – Feb 2025

## Publications

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### Diffusion

- **Pengxiang Li**, Kai Chen, Zhili Liu, Ruiyuan Gao, Lanqing Hong, Dit-Yan Yeung, Huchuan Lu, Xu Jia  
"TrackDiffusion: Tracklet-Conditioned Video Generation via Diffusion Models" (WACV2025)  
arxiv.org/abs/2312.00651
- Xiaomin Li, Xu Jia, Qinghe Wang, Haiwen Diao, Mengmeng Ge, **Pengxiang Li**, You He, Huchuan Lu  
"MoTrans: Customized Motion Transfer with Text-driven Video Diffusion Models" (MM 2024)
- Yicheng Yang\*, **Pengxiang Li**\*, Lu Zhang, Liqian Ma, Ping Hu, Siyu Du, Yunzhi Zhuge, Xu Jia, Huchuan Lu  
"DreamMix: Decoupling Object Attributes for Enhanced Editability in Customized Image Inpainting"  
arxiv.org/abs/2411.17223

## LLMs

- **Pengxiang Li**, Lu Yin, Shiwei Liu "Mix-LN: Unleashing the Power of Deeper Layers by Combining Pre-LN and Post-LN" (ICLR 2025) [arxiv.org/abs/2412.13795](https://arxiv.org/abs/2412.13795)
- **Pengxiang Li**, Lu Yin, Xiaowei Gao, Shiwei Liu "OwLore: Outlier-weighted Layerwise Sampled Low-Rank Projection for Memory-Efficient LLM Fine-tuning" (ICML 2025, in casting) [arxiv.org/abs/2405.18380](https://arxiv.org/abs/2405.18380)
- Wenfang Sun, Xinyuan Song, **Pengxiang Li**, Lu Yin, Shiwei Liu "The Curse of Depth in Large Language Models" (ICML 2025, in casting)
- Kai Chen\*, Yanze Li\*, Wenhua Zhang\*, Yanxin Liu, **Pengxiang Li**, Ruiyuan Gao, Lanqing Hong, Meng Tian, Dit-Yan Yeung, Huchuan Lu, Xu Jia "Automated Evaluation of Large Vision-Language Models on Self-driving Corner Cases" (WACV2025) [arxiv.org/abs/2404.10595](https://arxiv.org/abs/2404.10595)
- Yuhang Liu, **Pengxiang Li**, Zishu Wei, Congkai Xie, Xueyu Hu, Xinchun Xu, Shengyu Zhang, Xiaotian Han, Hongxia Yang, Fei Wu "InfiGUIAgent: A Multimodal Generalist GUI Agent with Native Reasoning and Reflection" [arxiv.org/abs/2501.04575](https://arxiv.org/abs/2501.04575)

## Internship Experience

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- **Shanghai Artificial Intelligence Laboratory (OpenMMLab)** Apr 2022 – Feb 2023  
Contributed to the MMTracking library, refactored algorithms for multi-object tracking and video instance segmentation.
- **Seekoo (AI Content Generation)** Feb 2023 – Jun 2023  
Worked on image generation for content creation, focusing on controllable generation.

## Honors & Awards

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- Meritorious Winner in the Mathematical Contest in Modeling (MCM), 2021
- First Prize in the Software Category at the 12th LanQiao Cup National Finals, 2021
- Runner-up in the Zhuhai, Hong Kong, and Macao AI Algorithm Competition, 2021
- Top 4 in Pedestrian Tracking at the Software Cup College Student Software Design Contest, 2021

## Referees

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- Prof. Huchuan Lu (IEEE Fellow), Dalian University of Technology, [lhchuan@dlut.edu.cn](mailto:lhchuan@dlut.edu.cn)
- Dr. Jue Wang (IEEE Fellow), Founder & President of Stylar AI, [max@seekoo.io](mailto:max@seekoo.io)
- Dr. Lu Yin, Assistant Professor in AI, University of Surrey, [l.yin@surrey.ac.uk](mailto:l.yin@surrey.ac.uk)