Pengxiang Li (He/His)

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EDUCATION

Dalian University of Technology `985` `Double 1st‑Class`   Sep 2022 - Jun 2025
MSc in Artificial Intelligence
IIAU Lab, under the supervision of Huchuan Lu
Key Course: Linear Algebra, Probability and Statistics, Matrix Computations, Machine Learning, etc.

Dalian Maritime University `211` `Double 1st‑Class`   Sep 2018 - Jun 2022
Geographic Information Science
BSc in Geographic Information Science
Recommended postgraduate upon the excellent undergraduate academic performance (Top5%)

RESEARCH INTERESTS

Video Generation, Large Language Model, Vision-Language Model, Object Tracking

PROJECT EXPERIENCE

Corner Case mining based on temporal relationship (Noah's Ark Lab)   Dec 2022 - Present

- 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.
- The corresponding paper "Automated Evaluation of Large Vision-Language Models on Self-driving Corner Cases" was submitted to ECCV 2024.

Oversmoothing in Large Language Model   Mar 2024 - Present
Intern, University of Surrey

- Explore the phenomenon of token over-smoothing caused by positional bias in the attention layer. In the attention block, all tokens are excessively focused on the first few tokens, which causes the tokens to become more similar and to collapse after passing through several layers.

Paper

Pengxiang Li, Kai Chen, Zhili Liu, Ruiyuan Gao, Lanqing Hong, Guo Zhou, Hua Yao, Dit-Yan Yeung, Huchuan Lu, Xu Jia *"TrackDiffusion: Tracklet-Conditioned Video Generation via Diffusion Models" (ECCV 2024 in casting) https://arxiv.org/abs/2312.00651*

Pengxiang Li, Lu Yin, Shiwei Liu "OwLore: Outlier-weighed Layerwise Sampled Low-Rank Projection for Memory-Efficient LLM Fine-tuning" (*NeurIPS 2024 in casting*) *https://arxiv.org/abs/2405.18380*

Yanze Li *, Wenhua Zhang *, Kai Chen *, **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"* (*ECCV 2024 in casting*) *https://arxiv.org/abs/2404.10595*

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 in casting*)

INTERNSHIP EXPERIENCE

Shanghai Artificial Intelligence Laboratory   Apr 2022 - Feb 2023
Intern OpenMMLab   Shanghai

- During my internship, I contributed to the maintenance and enhancement of the MMTracking algorithm library. My work primarily involved refactoring the multi-object tracking (MOT) and video instance segmentation (VIS) algorithms for MM2.0. I also integrated support for three new algorithms: Mask2Former for VIS, and the IDOL and VITA algorithms.

- In the research phase, I focused on improving video instance segmentation. Specifically, I redesigned the long video inference process based on VITA, eliminating heuristic matching between clips.

Seekoo   Feb 2023 - Jun 2023
Intern   Beijing

- Start-up company, founded by Dr. Wang Jue, a former Tencent 15-level outstanding scientist. Participate in the development and landing of algorithms for image generation AI in content creation, focusing on controllable generation.

HONORS & AWARDS

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 Dual Track of the 2nd Zhuhai, Hong Kong, and Macao Artificial Intelligence Algorithm Competition in 2021	2021
Top 4 in Pedestrian Tracking at the Software Cup College Student Software Design Contest	2021

REFEREES

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